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CONTENTS

ECONOMIC POLICY, ORGANIZATION AND MANAGEMENT

Economic Management as Key to Profitability (EKONOMICHESKAYA GAZETA, Jan 82)	1
Outmoded Management Methods, Laxity Scored (SOVETSKAYA ROSSIYA, 16 Feb 82)	22

INDUSTRIAL DEVELOPMENT AND PERFORMANCE

Structural Improvement of Social Production (S. Kheyman; PLANOVOYE KHOZYAYSTVO, Nov 81)	26
Reproduction of Industrial Output (M. Gorshkov; PLANOVOYE KHOZYAYSTVO, Dec 81)	36
Concentration of Industrial Production, Economic Development (I. Shilin; PLANOVOYE KHOZYAYSTVO, Feb 82)	44

RESOURCE UTILIZATION AND SUPPLY

Role of Science in Saving Material Resources (A. Chubarenko; PLANOVOYE KHOZYAYSTVO, Dec 81)	55
Methods of Saving Resources (A. N. Alov; GORODSKOYE KHOZYAYSTVO MORKVY, Jan 82)	67

ECONOMIC MANAGEMENT AS KEY TO PROFITABILITY

Moscow EKONOMICHESKAYA GAZETA in Russian No 2, Jan 82 pp 11-14

[Article: "Maximum Results with Minimum Expenditures"]

[Text] "The Leninist slogan of a regime of economy is not a temporary appeal, but rather a constant demand made of all members of our socialist society." -- L. I. Brezhnev, "Leninskim Kursom" [By a Leninist Course], vol 2, p 574.

In the 1981-1982 school year the system of economic education is teaching two new courses extensively: "Thrift Is a Communist Trait" (for workers and kolkhoz members) and "The Economical Economy" (for specialists and managers). The study of working people in these courses is organized in conformity with the decree of the CPSU Central Committee and USSR Council of Ministers entitled "Intensifying Work on Economy and Rational Use of Raw, Fuel-Energy, and Other Material Resources."

To help propagandists and their audiences, in 1981 EKONOMICHESKAYA GAZETA published six special inserts (see Nos 39, 41, 43, 45, 47, 49). We publish below material on the topics "Keep Track of Expenditures and Strengthen Cost Accounting [Khozraschet]" and "Accounting and Cost Accounting -- Ways To Intensify the Regime of Economy."

The publication of materials to help students study the new courses in the economic education system will be continued.

Earlier topics presented a detailed review of the basic factors of intensive development: raising labor productivity, rational use of fixed productive capital and capacity; conservation of raw and processed materials and fuel-energy resources; and, improving product quality. These factors have a direct influence on reducing the prime cost of output and increasing the income of socialist enterprises. As experience shows, a great deal here depends on

skillful use of the economic mechanism and the techniques of socialist economic management.

V. I. Lenin considered the regime of economy [rezhim ekonomii] to be the fundamental requirement of socialist economic management.

To manage economically means to use all available resources and every minute of working time carefully and to be a prudent master. V. I. Lenin emphasized this idea many times. "We must calculate everything now and each of us must learn to be calculating," Vladimir Il'ich said in his speech at the 20 November 1922 Plenum of the Moscow Soviet (vol 45, p 306). In his article "On the Fourth Anniversary of the October Revolution" he wrote as follows: "The proletarian state must become a cautious, calculating, and skillful 'master'" (vol 44, p 152).

It is important not just to conserve resources, but to be able to get the maximum possible output from them. Criticizing careless managers, V. I. Lenin reproached them by saying that they were not concerned about "conserving the kopeck that was given to them, and they do not try to turn it into two kopecks" (vol 45, p 16). Therefore, to implement a regime of economy means to manage the economy at all levels in order to get the greatest results with minimum possible expenditures.

Losses and leakage of resources that seem small at first glance become, on a national scale, enormous losses. Without learning to be thrifty on a small scale, it is impossible to achieve large economies. We must erect invincible barriers that prevent any, even the smallest losses and even minor cases of waste and mismanagement. This is the purpose of the regime of economy in a socialist society.

The planned regime of economy does not tolerate carelessness, mismanagement, the last-minute rush, and the superficial approach to affairs. The regime of economy and rational economic activity rest on scientific organization of labor and production and use of the advances of scientific-technical progress and progressive know-how.

Implementation of a regime of economy also has great indoctrinational and moral significance. It is an effective way to shape a communist attitude toward labor, a sense of being the master of production, and responsibility for the final results of production activity.

Under capitalism rigid economy within the enterprise goes along with enormous wastefulness on a society-wide scale as the result of critical declines in production, chronic unemployment, and vast underloading of production capacities. Meanwhile the economy at the enterprises themselves enriches the capitalists at the expense of worker health and poorer working conditions.

The distinctive feature of the regime of economy as a socialist method of management is that it permeates all levels of the economy, from the work position and enterprise to the sector and national economy as a whole. Under socialism, with public ownership of the means of production, all working people have an interest in the regime of economy because ultimately they are the only recipients of the fruits of economy.

Monetary Savings in the National Economy (except kolkhozes,
in billions of rubles)

Savings	1970	1975	1980
Total	139.7	176.2	234.1
Included in above			
Profit	87.0	104.5	116.0
Turnover Tax	49.1	66.6	94.1
Other Savings	3.3	5.1	24.0

Lenin's teachings on economical management and thrift have become an important part of party economic policy. "Our country," L. I. Brezhnev said at the ceremonial meeting in honor of the 100th anniversary of the birth of V. I. Lenin, "will become even stronger and richer and our movement toward communism will go faster if we learn to use every minute of working time, every gram of raw material and fuel, every machine part, and every labor kopeck economically."

The decree of the CPSU Central Committee and USSR Council of Ministers entitled "Intensifying Work on Economy and Rational Use of Raw, Fuel-Energy, and Other Material Resources " (June 1981) worked out concrete steps to develop a mass movement of working people for economy and thrift.

The policy of all-out conservation of resources is embodied in the 11th Five-Year Plan adopted by the recent sixth session of the USSR Supreme Soviet. It envisions, in particular, high rates of reduction in the prime cost of output. The assignments for growth in profit are set on this basis.

Under conditions of socialism profit is used to expand public production and for fuller satisfaction of the needs of the working people. Deductions from the profit of enterprises and economic organizations are the main income sub-heading of the USSR State Budget. A significant part of the profit remains at the disposal of the enterprises themselves to expand production and provide material incentive to workers.

The state, enterprise collectives, and all working people have an interest in the profitable work of all socialist enterprises. Enterprise profit received by expanding production and raising its efficiency is steadily growing. As the table above shows, for the national economy as a whole profit was 87 billion rubles in 1970, 104.5 billion in 1975, and 116 billion in 1980.

In the 11th Five-Year Plan profit in the national economy is to increase 40 percent, compared to 21 percent in the last five-year plan. The profit of enterprises and economic organizations in 1982 is envisioned at a level of 131.2 billion rubles.

Implementation of the regime of economy depends on every Soviet citizen. It is important that every working person measure every action against the requirements

of this regime, in both large matters and small. Cost accounting is a powerful means of achieving the regime of economy.

Cost Accounting Is an Important Tool for Economy

"Develop and strengthen cost accounting by every means on the basis of the assignments of the five-year plan and long-term economic norms." — from the document "Basic Directions of Economic and Social Development of the USSR in 1981-1985 and During the Period until 1990," which adopted by the 26th Congress of the CPSU.

Different methods of managing the economy are employed in economic life: planning and statistics, cost accounting, and socialist competition. They are all based on conscious use of objective economic laws that operate under socialism.

The socialist methods of management were first thoroughly substantiated in the works of V. I. Lenin. They have been continuously enriched during economic development as new conditions are taken into account. They must be used in a coordinated manner to achieve the objectives outlined by the party and successfully carry out state plans of economic and social development. If this coordination is lacking, of course, the impact of the different methods declines.

An important and inalienable part of the economic mechanism is cost accounting. This is a method of planned management of the socialist economy using commodity-money relationships. It is directed to achieving highly efficient production and receiving greater results with fewer expenditures. Cost accounting is organized on the Leninist principles of management which have been creatively developed by the CPSU during the building of communism. It embodies the system of economic relations between society and enterprises, enterprises among themselves, and various subdivisions within the enterprises. Let us review the principles on which these relations are built.

Basic Principles of Cost Accounting

The fundamental principle of cost accounting is that the enterprise should pay back expenditures for production and make a profit. As long ago as 1922 V. I. Lenin wrote the following: "I think that trusts and enterprises on cost accounting are founded precisely so that they themselves can be responsible, and I mean fully responsible, for seeing that their enterprises do not lose money." (Vol 54, p 150).

Cost accounting enterprises market their output and services at prices set by the state. Under normal management total income from marketing output (or services) should exceed enterprise expenditures for production and sale of the output manufactured (services rendered). This means that the enterprise earns profit, that it is operating profitably. But if an economic unit is managed irrationally and the means of production and labor resources are not used efficiently enough, it will have a low level of profitability, and sometimes even prove unprofitable.

Stable wholesale prices are a mandatory condition for planned cost accounting activity by enterprises. New wholesale prices were instituted for industrial output on 1 January 1982.

The wholesale prices in effect earlier had not, for most types of output, been revised for some 14 years. During this time the costs of production had declined in some sectors as the result of technical progress (for example electronics and some sectors of machine building), while in others, for various reasons, they had risen (chiefly the sectors of extracting industry). As a result, the wholesale prices formerly in effect no longer reflected the true costs of production and did not create proper cost accounting stimuli for enterprises.

The new wholesale prices insure more favorable conditions for the cost accounting activity of enterprises and efficient use of other economic stimuli and levers envisioned by the 12 July 1979 decree of the CPSU Central Committee and USSR Council of Ministers on improving the economic mechanism. They will promote more economical expenditure of fuel-raw material resources, an improvement in the quality of output, and an increase in production efficiency.

In conformity with the decree of the CPSU Central Committee and USSR Council of Ministers entitled "Improving Planning and Economic Stimulation of the Production and Procurement of Agricultural Products," dated 14 November 1980, state purchase prices for agricultural output are being refined in order to create conditions to strengthen cost accounting and insure expanded reproduction at the kolkhozes and sovkhozes.

To enable the cost accounting enterprise to decide questions operationally and efficiently, it is given certain rights and has economic independence. The economic independence of enterprises is exercised within the framework of the state plan, with strict fulfillment of existing laws, statutes, and norms.

Associations and enterprises are allocated the necessary production capital and broad rights in the fields of planning, capital construction, improving production engineering and technology, material-technical supply and marketing, finances, and labor and wages in order to insure their economic independence.

The activity of cost accounting enterprises is structured, therefore, on a combination of centralized management with the economic independence and initiative of the working collective. They have independent balances, complete systems of accounting, and the rights of a legal person, which means that they can conclude economic contracts, receive credit, bring lawsuits, and answer for their obligations.

The rights and duties of state enterprises are fixed in the Statute on the Socialist State Enterprise (ratified on 4 October 1965).

While carrying on production and management activity based on cost accounting, the Statute reads, the enterprise insures attaining the greatest results with minimum expenditures of labor, material, and financial resources in the interests of the national economy. It is obligated to make maximum use of

production capacities, internal reserves, and land and other natural resources it is allowed to use. It must comply strictly with the regime of economy, introduce the latest advances of science, technology, and progressive know-how and also progressive norms for expenditure of raw and processed materials, fuel, and electrical energy, reduce the prime cost of output (jobs, services), and raise the profitability of production.

The rights and duties of production associations are defined by the Statute on the Production Association (Combine), which was adopted on 27 March 1974.

The association or enterprise passport fosters fullest use of production reserves. On the basis of accounting and statistical reports this document gives a description of production capacities available and their use, the technical level and organization of production, the use of material and labor resources, and the quality of output.

Cost accounting gives every production collective an interest in highly profitable work. This is insured by combining state interests with the material interest of the entire collective and of each individual worker in good final results of the activity. Socialism and communism must be built, V. I. Lenin emphasized, "not on enthusiasm directly, but with the help of enthusiasm generated by the great revolution, on personal interest, on personal involvement, on cost accounting" (Vol 44, p 151).

The collectives of enterprises are given a material interest by the fact that the enterprise reimburses expenditures with its own income: part of the profit received by the enterprise remains at its disposal. The better the enterprise works, the more high-quality output it produces, and the lower its production costs are, then the more capital it will receive for technical improvement of production, material incentive to workers, and improving their housing and cultural-domestic conditions.

Enterprise profit is the source from which economic stimulation funds are formed. These are the material incentive fund, the fund for sociocultural measures and housing construction, and the production development fund.

The economic stimulation funds of industrial enterprises have reached considerable dimensions. In 1965 1.4 billion rubles from them was used, but in 1975 the figure was 14.5 billion, and in 1980 it was 18.1 billion rubles.

Deductions to economic stimulation funds are made on the basis of stable norms differentiated by years of the five-year plan. The norms are set depending on fulfillment of the plan of deliveries, growth in labor productivity, production of output in the highest quality category, and growth in profit. The fund-formation indicators may be reducing the prime cost of output, return on capital, and other qualitative indicators with due regard for the specific features of particular sectors and forms of production.

Figures on the distribution of the profit of state enterprises and economic organizations show that in 1965 they paid 70 percent of their profit to the budget and 30 percent was left at their disposal; in 1980 the budget payment

was down to 59 percent, leaving 41 percent at the disposal of the enterprises and organizations.

Correctly organized material stimulation is a powerful means of mobilizing collectives to search out and make full use of intensive factors of economic growth. The 26th Congress of the CPSU posed the challenge: "Continue improving the system of material incentive taking into account the concrete contribution of each labor collective and individual worker to the results achieved. Develop effective forms of incentive for collectives to fulfill and overfulfill plan assignments with a smaller number of workers and employees, using the savings in the wages fund to stimulate growth in labor productivity and an improvement in the quality of work."

The decree adopted in June 1981 on conservation of all resources intensifies the cost accounting dependence of the economic stimulation of ministries, departments, associations, enterprises, and organizations on the level of material expenditures per ruble of output (work). Beginning in 1983 direct deductions will be made to these funds from the total savings received by reducing material expenditures in comparison with a ratified ceiling. When the ceiling is exceeded deductions to the funds will be reduced, but not more than 25 percent of their planned magnitude.

The material interest of labor collectives in fuller use of production by-products, recycled resources, and local raw materials is rising.

The profit actually received from sale of consumer goods and production-technical articles manufactured from production waste products remains at the disposal of the associations, enterprises, and organizations and is transferred to the consumer goods fund: fully when profitability (relative to production costs) is up to 25 percent, and one-half of any amount exceeding 25 percent if the value of the waste products used to produce the goods and articles is 50 or more percent of the value of all the raw and processed materials, not counting the cost of subsidiary materials.

Cost accounting along with granting the enterprise definite rights and material incentive for successful production-management activity also presupposes the material accountability of the enterprise collective and its individual workers for rational management of the enterprise. A worsening of the activity of the enterprise leads to a reduction of economic stimulation funds and diminished possibilities of material incentive to the workers. The enterprise must pay fines and penalties for violation of the particular conditions of the economic contract which defines the rights and obligations of the parties, for example for failure to deliver output or unload railroad cars on time or for lower quality articles. These penalties reduce profit.

The procedure for application of economic sanctions is defined by the Statute on Deliveries of Production Output and the Statute on Deliveries of Consumer Goods (see EKONOMICHESKAYA GAZETA, Nos 20 and 21 for 1981).

Thus, a supplier pays the buyer liquidated damages for failure to deliver output on time or in the full amount. The damages are determined as a percentage of the cost of the product not delivered on time by particular headings of the

products list or assortment. For consumer goods the liquidated damages are five percent, while for production-technical goods the figure is eight percent.

For each violation of an agreed-upon shipping (delivery) schedule for output the supplier pays the buyer a penalty in the amount of one percent of the value of the products not shipped (delivered) on time if different penalty amounts are not envisioned in the special delivery conditions or the contract.

When products are defective because their quality does not conform to standards, technical specifications, or models, the buyer or receiver must refuse to accept and pay for the product and charge the manufacturer or supplier a penalty of 20 percent of the cost of the defective goods; if the goods have already been paid for, the buyer must demand return of the amounts paid by established procedures.

Material accountability is reinforced by the system of ruble control (monitoring). This control should cover all aspects of production-management activity and reflect the real magnitude of costs, profit and losses, and timely performance of obligations to other collectives. Ruble control over enterprise activity is carried on by higher-ranking economic bodies, banks, and state and public control agencies.

The effectiveness of monitoring is determined above all by accounting. V. I. Lenin emphasizes: "Not a single article, not a single pound of bread should be outside the accounting system, because socialism is above all accounting" (Vol 35, p 57).

It is important that accounting make it possible to disclose the real picture of the movement of resources within the enterprise, their use and losses, reserves, and missed opportunities. Without such records effective cost accounting for production subdivisions is impossible. It is not accidental that leading collectives consider accounting crucial, and are constantly refining it applicable to the conditions in which the association or enterprise is operating. Well-organized accounting makes it possible to compare plan assignments with their performance on an operational basis, and take necessary measures promptly to raise production efficiency.

Leading enterprises are successfully using the normative method of accounting for production expenditures. It is based on norms and makes it possible to account for particular types of output and the causes and responsible parties when cost deviates from the normative level. These data are essential for operational control of production. Some 5,000 enterprises are already using the normative method of accounting. This is about 40 percent of the total number of enterprises where use of this method would be advisable. The June 1981 decree on conservation of resources foresaw completing the transition to the normative method of accounting in the current five-year plan.

The 26th Congress of the CPSU demanded: "Intensify monitoring of the results of economic activity at all levels of the economy. Improve monitoring-auditing work. Increase the role of people's control agencies, accounting, and departmental monitoring in insuring state discipline, preservation of socialist property, and compliance with the regime of economy."

Concrete forms of cost accounting are being refined on the basis of strict adherence to Leninist principles of management and accumulated experience. The most vivid and important characteristic of the current phase of development is its firm orientation to intensification of production and raising its efficiency.

Internal Cost Accounting

The production activity of shops, sections, brigades, divisions, and other elements of the enterprise or association is usually carried on on the basis of internal cost accounting.

Internal cost accounting is expected to accomplish the same objectives as enterprise cost accounting, to promote achievement of the greatest final results with minimum expenditures on the basis of raising the work efficiency of shops, sections, and brigades. This is accomplished by establishing correct economic mutual relations between the enterprise and its subdivision through planning and evaluation indicators and a system of material and moral incentive.

Internal cost accounting has, at the same time, its own specific features. Thus, shops, sections, brigades, and other subdivisions have limited economic independence in comparison with the enterprise. They operate in conformity with statutes ratified by the management of the association or enterprise.

There are many different specific forms of organization and mechanisms of the functioning of internal cost accounting. The choice of a system of plan assignments, procedures for accounting and evaluating fulfillment of assignments, and the forms of cost accounting incentive and accountability depend on the scale of the subdivision, the type of production, and other factors.

The cost accounting of the enterprise and the cost accounting of its subdivisions are a single integrated element. This means that the production assignments, norms for resource expenditure, plan assignments, and indicators of different units should be completely coordinated among themselves.

The system of plan indicators established by the subdivisions and the organization of accounting for fulfillment of them are expected to provide an objective evaluation of the contribution of the shop, section, brigade, or division to the final results of work of the entire enterprise collective. Of course, these indicators and their system should be as simple and comprehensible as possible.

A precise system of cost accounting relations among particular subdivisions and an effective system of material and moral incentive for employees have an important place in internal cost accounting.

Securing production resources for the subdivision, especially equipment, machinery, and space, and correct organization of the storage system and accounting for use of labor and material resources are special questions.

The most fundamental thing for effective internal cost accounting is norms. Comparing labor and material expenditures with plan norms set for the subdivisions makes it possible to reveal the work efficiency of labor collectives.

Further elaboration of the system of internal cost accounting largely relates to rapid growth in cost accounting brigades and adaptation of their forms to concrete production conditions.

The Kaluga Pipe Plant Association has accumulated interesting know-how with cost accounting brigades. Their experience was the subject of an article in No 43 of EKONOMICHESKAYA GAZETA in 1979 and in the book "Khozraschetnyye Brigady v Promyshlennosti" [Cost Accounting Brigades in Industry], which was published by Izdatel'stvo "Pravda" in 1981.

In construction the brigade contract is finding increasing application. It was conceived in 1970 in the collective headed by N. A. Zlobin, who is today a Hero of Socialist Labor. About one-third of the country's construction-installation brigades now operate on a cost accounting basis. During this time the pioneer brigade has grown almost 50 percent, but its output per member has more than tripled.

Cost accounting brigades and teams have worked out well in agriculture.

For example, the mechanized cost accounting team of I. Filonov of the Kolkhoz imeni Sverdlov in Krasnogvardeyskiy Rayon of Stavropol'skiy Kray performed its assignment for production of gross agricultural output in 1981 by 122 percent, attaining a production volume of 1,187,000 rubles compared to a plan figure of 928,000. Planned expenditures for production for the team were 192,000 rubles, but the actual figure was 181,000. The material incentive system is made dependent on the economy achieved.

Reserves for Raising Profitability

"Strive to raise profitability, eliminate unprofitable production, and increase profit, above all by reducing prime cost, raising labor productivity, and improving the quality of output" — from the document "Basic Directions of Economic and Social Development of the USSR in 1981-1985 and During the Period Until 1990," which was adopted by the 26th Congress of the CPSU.

The summary expression of the results of an enterprise's cost accounting activity is an improvement in final financial results, growth in profitability, which indicates that income exceeded expenditures in monetary terms.

Reducing the Prime Cost of a Unit of Output

Reserves for raising the profitability of production are determined by three fundamental factors. These are reducing the prime cost of a unit of output (through reduction in labor-intensiveness and materials-intensiveness, growth in the output-capital ratio, and decrease in administrative-management and other expenditures), increasing enterprise income from sale of output (by reducing prime cost, increasing volume of sales of output, and improving its quality), and increasing final (balance) profit (by eliminating various unproductive losses). Let us consider each of these factors in greater detail.

Reducing the prime cost of output is the foundation of growth in production profitability. Prime cost in monetary form expresses all enterprise expenditures for the production and sale of output.

The prime cost of output is a kind of mirror of economic activity which reflects the results of production-management work. As separate streamlets and shallow creeks flow together to form mighty rivers, so all expenditures, from the most insignificant to the largest, are assembled together in prime cost. But expenditures are not rivers. They can and must be reduced, and some must be avoided. To do this one must know how, by what means, they can be influenced.

The search for internal production reserves begins by studying the prime cost of each type of output and work. Ultimately, it reflects changes in labor-intensiveness, materials-intensiveness, and the output-capital ratio of production and represents the results of the campaign for economy and rational use of resources.

The final section of this article (below) uses the example of the prime cost of one of the articles produced by the Moscow ATE-1 Plant to demonstrate the methodology for searching for reserves to reduce expenditures to produce a unit of output.

Total monetary expenditures for the production of all the output of an enterprise, association, or sector which are included in the prime cost of output can be put into four basic groups.

First of all there are expenditures for raw materials, primary and subsidiary materials, fuel, and energy. They embody past labor. Above all this is the labor of other production collectives. To conserve it means to avoid additional capital investment to expand production, to spare transportation from performing superfluous shipping, and to save labor at other enterprises. At the same time this makes it possible to produce more output from the same raw and processed materials with the same fuel and energy. Moreover, it costs less. The distinctive feature of expenditure of these resources (production working capital) is that they transfer their value fully to the newly manufactured output.

Expenditures of past labor related to the use of machinery and equipment, instruments, production quarters, and buildings, which make up fixed productive capital, transfer their value and are reflected in the prime cost of output differently. They are used over a protracted period to produce output, often highly varied forms of output. Of course, fixed capital gradually wears out. As it wears out its value is transferred to the output manufactured or, as they say, it is amortized. The corresponding norms of wear are called amortization norms, and the amounts are called amortization deductions. Amortization norms are set for a definite time, for example 5-10 years. Therefore, the more output that is produced on given equipment in a year, the lower the amortization deductions per unit will be. Thus, we have here a major reserve for reducing prime cost which can be used actively in every labor collective.

Expenditures related to the use of live labor, wages, and social insurance deductions, are an important element of the prime cost of output. It is common knowledge that the total size of the wages fund in our country is steadily growing and the earnings of working people are rising. This is one of the manifestations of the concern of socialist society for the working person. But a distinction must be made between the total sum of these expenditures and the amount which goes for one article. It is important for growth in labor productivity to exceed increase in wages. In this case the amount of these expenditures per unit of output will decrease.

Faster growth in labor productivity than in average wages paid to employees is a rule of development of socialist production and a key principle of efficient management.

Finally, there is one more group, called other expenditures. These include, for example, expenditures on the sale of output, for guaranteed service and repair, and a few other items.

The ratios among particular elements in total expenditures for production determine the structure of costs.

Structure of Expenditures for the Production of Industrial Output (in prices of the corresponding years, percent of total)

Expenditures	1960	1980
All Expenditures	100	100
Raw Materials, Basic and Subsidiary Materials, Fuel, and Energy	74.0	72.6
Amortization	3.7	7.7
Wages and Deductions for Social Insurance	19.3	14.8
Other Expenditures	3.2	4.9

As can be seen from the table, in USSR industry in 1980 raw materials, primary and subsidiary materials, fuel, and energy accounted for 72.6 percent of all expenditures for production. Depreciation was 7.7 percent, while wages and social insurance deductions were 14.8 percent and other expenditures were 4.9 percent.

The structure of expenditures for production differs in different industrial sectors. In machine building and metalworking, for example, wages and social insurance deductions accounted for 22.5 percent of all expenditures for production in 1980, while in the electric power industry the figure was 11.4 percent, in light industry it was 8.5 percent, and in the food industry just 6.6 percent.

Expenditures for raw materials and primary and subsidiary materials were most substantial in light industry — 88.1 percent, and in the food industry — 85.1 percent. In machine building and metalworking these expenditures are 62.4 percent, whereas the electric power industry has only subsidiary materials with account for just 5.4 percent. Expenditures for fuel and energy in the electric power industry reach 49.6 percent, whereas in machine building and metalworking the figure is three percent, in the food industry it is two percent, and in light industry only one percent. Amortization is fairly substantial in the electric power industry (22.6 percent), while in machine building and metalworking it is 6.6 percent, in the food industry 3.8 percent, and in light industry 1.6 percent.

A review of the structure of expenditures makes possible a general evaluation of the basic directions of the campaign to reduce the prime cost of output.

Reducing the labor-intensiveness of output by raising labor productivity plays a special role in lowering the costs of producing output. In the labor-intensive sectors of production reducing labor-intensiveness is an enormous reserve for lowering the prime cost of output. As labor productivity increases labor expenditures per unit of output go down and the share of wages in the structure of prime cost decreases.

In 1960 expenditures for wages with social insurance deductions were 19.3 percent of total expenditures for production in industry; in 1980 the figure was 14.8 percent, although in this time the average wage of workers and employees rose from 91.6 rubles to 185.4 rubles, that is more than doubled.

The decisive factor in reducing production expenditures is scientific-technical progress. The 1982 plan envisions raising the technical level of production to receive a savings of 3.3 billion rubles from lowering the prime cost of industrial output.

A major reserve for lowering production costs is improving the organization of production and labor. The 1982 plan for industry envisions receiving a savings of 161 million rubles by this factor.

The prime cost of a unit of output includes a certain figure for expenditures for administrative and management costs. Here too there are significant reserves for economy related to improving the organization of management labor and eliminating superfluous administrative-management personnel, as well as in postal, telegraph, and other expenditures. The ministries and departments, as well as the enterprises and associations, have been given assignments for 1982 to refine and reduce the cost of the administrative apparatus and to economize on management expenditures. The total amount of the savings from this factor for the national economy in 1982 should be 1.1 billion rubles.

Growth in Enterprise Income

Lowering the prime cost of a unit of output is the most important, but not the only reserve for raising the profitability of production. Increasing enterprise

income, raising its profitability, has a prominent role in this. Growth in profitability is one of the primary indicators of the efficient work of a sector, association, or enterprise.

The output of socialist enterprises in industry is sold at stable wholesale enterprise prices (state purchase prices in agriculture) that are set by a planned procedure. For each type of output these prices include the average sectorial prime cost and a certain planned profit. Therefore, the lower the prime cost of output is, the greater profit will be.

The total volume of profit from production of output depends on lowering the prime cost of each unit of output, the total volume of production, and raising the quality of output.

These factors affect the amount of profit in all sectors of the economy. In agriculture, profitability also depends on receiving the special supplement to state purchase prices.

In the years before the 11th Five-Year Plan the kolkhozes and sovkhoses received a 50 percent supplement from the state for output produced beyond the state purchase plan. This amount is now included in state purchase prices, which will help strengthen the economy of all the farms. Moreover, the plan for 1981-1985 has established a 50 percent supplement to state purchase prices for selling grain, sunflower, sugar beets, raw cotton, and other products to the state beyond the average level achieved in the 10th Five-Year Plan. Four billion rubles is being appropriated for this purpose in 1982.

It is apparent that the new method of paying supplements gives preference to those farms which insure an increase in the production and state purchase of output in comparison with the level actually achieved, whereas earlier the supplement could be received by farms which did not increase sale of output to the state, but rather had lower state purchase plans.

The state plan for 1982 set profit in industry at 77.5 billion rubles. The profit of sovkhoses and other state agricultural enterprises should be 4 billion rubles, while contracting construction-installation organizations should have a profit of 6.3 billion rubles.

The principal way to increase the profitability of an enterprise is to lower the prime cost of production. Thus, the share of reducing prime cost in growth in industrial profit in 1985 compared to 1980 will be as follows for particular ministries (in percentages):

Ministry of Electrical Equipment Industry	51.4
Ministry of Chemical and Petroleum	
Machine Building	46.6
Ministry of Power Machine Building	45.9
Ministry of Automotive Industry	44.7
Ministry of Construction, Road, and	
Municipal Machine Building	43.4
Ministry of Heavy and Transport Machine Building . .	41.4
Ministry of Instrument Making, Automation Equip-	
ment, and Control Systems	40.0

With growth in the volume of output produced, enterprise profit increases not only by lowering prime cost but also as a result of the increase in the amount of output produced. The greater the volume of production, where other conditions are equal, the greater the profit received by the enterprise will be.

At the Moscow ATE-1 Plant the full prime cost of manufacturing a starter was 16 rubles 10 kopecks with a wholesale price of 16 rubles 85 kopecks. The profit from one part was 75 kopecks. In 1980 the plant produced 152,000 starters, receiving a profit of 114,000 rubles from their sale.

The total amount of profit comes from the profit for particular parts and types of output. To determine the amount of profit it is necessary to juxtapose the volume of commodity output in wholesale prices with its full prime cost.

For example, if the commodity output produced in a month was worth 5.2 million rubles in wholesale prices and its full prime cost was 4.5 million rubles, the profit for this output would be 700,000 rubles.

It is advisable to review the profitability of each article produced to identify reserves for raising profitability. Many enterprises produce both articles that are profitable and articles whose prime cost is higher than the wholesale price. The presence of unprofitable articles indicates above all that the technical-organizational level of their production at the particular enterprise is much lower than the sectorial average. Studying progressive know-how and, in many cases, modifying the established irrational specialization and cooperation in production will make it possible to avoid losses and raise the total profitability of the enterprise.

In addition to lowering the prime cost of output and increasing the volume of production, the amount of enterprise income depends greatly on the quality of output. When the quality of output rises, where other conditions are equal, enterprise profit grows. Production of high-quality output is advantageous both to the national economy and to the labor collective.

Enterprises are given economic incentive to increase the production of output in the highest quality category and to withdraw from production or modernize output in the second quality category by means of prices. The system of incentive supplements to wholesale prices for new, highly efficient production-technical output whose parameters correspond to the best domestic and foreign models promotes this.

The sum of additional profit from sale of output in the highest quality category was 333.2 million rubles in 1980 for the machine building ministries alone.

Incentive supplements are established for periods of up to one year, and up to two years for particularly complex output. When an article is awarded the Mark of Quality the effective period of the supplement is increased to four years, and five for particularly complex products.

Economic incentive is also provided for production of high-quality consumer goods. The wholesale prices for the first experimental batches of goods and for especially fashionable articles are set depending on their quality and use features. When an article is awarded the honor of bearing the pentagon sign of the Mark of Quality, the temporary wholesale prices are applied for the entire effective period of the mark.

Additional profit which an enterprise receives from selling new, highly efficient output and output with the Mark of Quality is distributed as follows: up to 70 percent goes to the economic stimulation funds, and the remainder is split evenly between the state budget and the uniform fund for development of science and technology in the sector.

The Leningrad Hoisting and Transportation Equipment Plant imeni Kirov submitted a multispan overhead crane for state certification in 1980. Compared to similar cranes already in production the new crane had 20 percent greater traveling speed and a 50 percent longer service life to major overhaul. Considering the economic effect from use of the crane, an incentive supplement of 6,100 rubles was added to the effective wholesale price of 78,000 rubles.

The Plant imeni Kirov and the planning-design organizations that built the crane will add about 4,000 rubles per crane to the economic stimulation funds when they are sold. The rest of the supplement will go to the state budget and uniform fund for the development of science and technology.

If it is found, when re-certifying an article with the Mark of Quality, that its technical-economic characteristics have improved, the incentive supplement established earlier is continued or even increased.

Incentive supplements for high-quality output greatly increase the profitability of the enterprise and add significantly to incentive funds.

The Nevskiy Zavod Production Association raised the proportion of its output with the Mark of Quality from 34 percent in 1979 to 50.6 percent after the first nine months of 1981.

The additional enterprise profit received through incentive supplements for sale of output with the Mark of Quality and for efficiency was 2.8 million rubles in 1980 and 2.1 million rubles for the first nine months of 1981. Following existing procedures a significant part of this income was put into incentive funds.

Here are the corresponding figures for the Ivanovo Machine Tool Building Association imeni 50-Letiya SSSR:

Indicators	1979	1980	1981 (9 Months)
Percentage of Output with the Mark of Quality	40.5	44.7	54.9
Total Incentive Supplements Received (rubles)	316,000	932,000	1,163,000

In the first nine months of 1981 the association received 1,163,000 rubles of price supplements for raising the quality of output. This was more than for all of 1980.

The price formation system also contemplates economic sanctions against enterprises. Thus, discounts from the wholesale price are employed for output in the second quality category and output that was not certified on time. Deductions from the wholesale price are paid to the state budget. They make it unprofitable not only to produce, but also to buy obsolete output; output in the second category is sold at the full wholesale price, with no discount.

If the state Mark of Quality is taken away from a product, at the same time the enterprise loses the right to receive the corresponding incentive supplement to its price.

We have considered how enterprise profit is formed from the production activity of the enterprise and what factors influence its amount. But enterprise profit from the production of output, which has been the subject thus far, is not actual profit until the output is sold. To receive profit one must receive money for the output or services, and avoid various types of losses at the same time. This final, real profit is called balance profit.

Growth of Balance Profit

Balance profits are made up of three parts. These are profit from sale of commodity output, profit from other sales, and finally, profit or loss from unrealized income and expenditures.

Each of these component parts of balance profit characterizes one aspect of the enterprise's economic activity. Profit from the sale of output is determined above all by the amount of output sold and the prices for it. Output is considered to be sold when the customer has paid for it. So here we see that it is not enough just to produce the output; it must be delivered to the customer on time and the money must be received. The marketing services and the financial and legal subdivisions of the enterprise have a large part in this.

Of course, the composition of output produced also influences profit from sales. The point here is that profitability differs for different types of output at one and the same enterprise. But this is taken into account in planning enterprise profit, and we cannot tolerate the efforts of certain managers to receive profit by structural changes in the output produced by violating state plan assignments and contracts with customers.

Profit from other sales occurs in connection with the sale of output, work, and services not related to the enterprise's primary activity. Sale of purchased articles and goods and above-norm and surplus material assets influences the amount of this profit. Enterprises generally make such sales at a loss, because they are done at wholesale prices without consideration of expenditures for delivery and storage of materials, which causes the enterprises to lose.

Another reason for losses from other sales can be the high prime cost of nonindustrial services. This refers, in particular, to in-house capital construction. This work is often done by the enterprise's repair-construction shops, which also take employees from the primary shops. They do not have construction occupations. In this case the workers do not fulfill output norms, but they are paid an average wage in conformity with labor law.

Unrealized profit includes receipts from bad debts written off earlier; profit from past years identified in the report year; penalties and fines received; profit for transactions with packages, and other income.

In the first nine months of 1981 the enterprises and organizations of the Ministry of Tractor and Agricultural Machine Building had 36 million rubles worth of unproductive expenditures and various losses, which was 3.8 percent of total profit. If it had not been for these losses, the industrial profit of this ministry would have been 36 million rubles more. A significant proportion of these losses (21 million rubles) was fines and penalties, which indicates that the enterprises are violating economic contracts. Strengthening contract discipline is a major reserve for raising enterprise profitability.

As we have seen, the magnitude of balance profit is a generalizing indicator of the efficiency of the production-management activity of the enterprise. But this indicator should be compared against the resources with which it was achieved. Profitability indicators are used for this purpose: the ratio of the sum of balance profit as a percentage to the prime cost of output sold or to production capital.

The first indicator gives a representation of the efficiency of current expenditures for production, expenditures for wages, raw and processed materials and energy used, and amortization deductions.

But the ratio of balance profit to production capital reflects the efficiency of use of all resources available at the enterprise.

Let us suppose that an enterprise in 1981 has an average annual volume of fixed production capital of 1.8 million rubles, while the norm of working capital is 1.4 million rubles. Balance profit is 480,000 rubles, and the prime cost of commodity output is 4.8 million rubles.

Profitability relative to prime cost of output is 10 percent in this case.

Profitability relative to production capital in this case is 15 percent.

The higher profitability is, the better the enterprise is using its available resources. A high level of profitability is above all the result of good basic production activity by the collective, defined by the volume of output produced and its high quality with low prime cost. On the other hand, it is a result of well-organized work by all subdivisions of the enterprise.

Analysis of Profitability

During the analysis it is necessary to determine first of all how the plan assignment is being fulfilled for lowering prime cost and increasing profit, what reserves there are, and what needs to be done to put them into use.

An important part of the analysis is studying report cost calculations of the prime cost of particular articles.

For example, here is what made up the prime cost of the starter for the ZIL-130 truck, produced by the Moscow ATE-1 Plant (figures given in rubles-kopecks per article):

Name of Costing Heading	Plan	Actual	Over or Under
Raw and Processed Materials	6-04	6-23	0-19
Transportation-Procurement Expenditures	0-32	0-30	0-02
Reuseable Remnants (subtracted)	0-59	0-60	0-01
Purchased Semifinished Parts	4-71	4-42	0-29
Fuel and Energy for Production Purposes	0-12	0-12	-
Wages of Production Workers and Social Insurance Deductions	1-47	1-40	0-07
Expenditures for Equipment Maintenance and Operations	2-42	2-20	0-22
Shop Expenditures	0-82	0-67	0-15
General Plant Expenditures	1-28	1-14	0-14
Losses from Defective Work	-	0-03	0-03
Nonproduction Expenditures	0-20	0-19	0-01
Full Prime Cost	16-79	16-10	0-69
Profit	0-06	0-75	
Wholesale Price of Article	16-85	16-85	

As the costing report shows, an overexpenditure of 19 kopecks occurred under the heading "Raw and Processed Materials." Detailed analysis showed that the plant was saving ferrous and nonferrous metal worth 12 kopecks on each starter. But this savings was "eaten up" by overexpenditure of insulation and other materials. This was a case of irrational substitution of materials and uneconomical use in production. The overall result was an overexpenditure of raw and processed materials of 19 kopecks per article, or 28,900 rubles for the full volume of production.

The cost calculation shows that there is some savings for transportation and procurement expenditures. Production by-products were used better, which was

reflected in a savings of metal. The plant saved 29 kopecks per starter on purchased semifinished parts, which was more than 44,000 rubles for the year. This was done by better placement of orders.

The figures in the cost calculations show that fuel and energy expenditure per article were within the limits set by the plan.

The plant spent one ruble 40 kopecks under the "Wages" heading to manufacture one starter, while the plan was one ruble 47 kopecks. This was because the actual level of labor intensiveness in starter production proved lower than planned.

Analysis of expenditures for production service and management, which are reflected in three headings, is interesting. Above all this relates to expenditures for maintenance and operation of the equipment. This heading includes expenditures for maintenance of work positions, current repair, and operation of production equipment. The savings here (22 kopecks per article) testifies above all to fuller loading of the equipment by increasing the production of articles.

Shop expenditures have a considerable portion of the prime cost of output. These include expenses for maintaining shop personnel, current repair and amortization of shop buildings, structures, and other fixed capital, expenditures for labor protection, and certain other nonproduction expenditures related to shop activity. The absolute amount of these expenditures hardly depends at all on changes in the volume of production and number of workers. This means that the more output is produced, the smaller the proportion of these expenditures in the prime cost of a unit will be. The collective received a significant savings on this account, 15 kopecks per starter and about 23,000 rubles for the annual volume of production.

General plan expenditures occupy an even larger part of prime cost. These include expenditures for maintenance of the management apparatus of the enterprise, plant-wide expenditures, and nonproduction expenditures of the entire enterprise (maintenance and amortization of plant buildings and general production inventory, expenditures for labor production, and others). Under this heading they saved 14 kopecks per starter and more than 21,000 rubles for annual production.

Losses from defective work, which are not planned, raised the prime cost of each article by three kopecks, which was more than 4,500 rubles for the year.

Nonproduction expenditures included in prime cost (expenditures for sale of output and certain others) were one kopeck lower, which produced an annual savings of more than 1,500 rubles.

Thus, the full prime cost of the starter was determined to be 16 rubles 10 kopecks, compared to a plan figure of 16 rubles 79 kopecks. The above-plan savings was 69 kopecks per item or 105,000 rubles for all production.

Practically no enterprise produces just one type of article; they generally produce several. Therefore it is important to know their overall prime cost, the prime cost of all the commodity output produced.

Change in the overall prime cost of commodity output is analyzed by the indicator of expenditures per ruble of commodity output, which is a generalizing indicator of the prime cost of output.

Let us suppose that an enterprise has the following figures in its calculation for the year:

Indicators	Plan	Actual
Prime Cost of Commodity Output (rubles)	3,250,000	3,309,000
Commodity Output in Wholesale Prices (rubles)	3,800,000	3,950,000
Expenditures per Ruble of Commodity Output (kopecks)	85.5	83.8

The figures in the table show that the plan assignment for level of expenditures per ruble of commodity output was overfulfilled. The plan assignment was 85.5 kopecks; actual expenditures were 83.8 kopecks, which means that they received above-plan savings of 1.7 kopecks for each ruble of output produced. This means that with a total volume of production of commodity output of 3,950,000 rubles in wholesale prices the above-plan economy was 67,150 rubles (1.7 percent of 3,950,000 rubles).

Analysis of the prime cost of a unit of output and of its entire production volume leads to identifying the summary indicator of enterprise activity — balance profit, and through it to the profitability of production.

It can be seen from our example that all commodity output in wholesale prices exceeds its prime cost by 641,000 rubles. This difference describes enterprise profit. But as already observed, real balance profit may be significantly different from potential profit. It is analysis that should answer the questions: where did these losses take place, who was responsible, and what must be done to avoid them in the future?

There are reserves for increasing production efficiency everywhere. Comprehensive analysis of economic activity and combined searching for reserves are an important element of the national campaign for economy and thrift.

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ECONOMIC POLICY, ORGANIZATION AND MANAGEMENT

OUTMODED MANAGEMENT METHODS, LAXITY SCORED

Moscow SOVETSKAYA ROSSIYA in Russian 16 Feb 82 p 1

[Article: "The Headquarters of the Sector"]

[Text] The ministry is often called the headquarters of the sector. The comparison is valid, for this central organ of administration elaborates and, on the basis of the control figures of the five-year plans, approves for its enterprises the plan assignments. The strategy and tactics in the spheres of the organizational, economic and technical development of the sector are formulated here. In essence the triumphs and failures of today and the future originate precisely in the ministry, just as in any other headquarters.

The 11th Five-Year Plan has set difficult and responsible tasks in the area of economics. The production volume in industry should increase by 26-28 percent and in agriculture by 12-14 percent. It is not easy to achieve what has been planned. In contrast to past five-year plans, the possibilities of the development of sectors by means of the enlistment of additional production and manpower resources will be appreciably limited. The formed situation is explained first of all by three factors: the decline of the growth of the able-bodied population, the need to allocate considerable capital for the development of uninhabited regions of the north and the Far East, the increase of the expenditures on environmental protection. Thus, we should no longer count on the extensive means of development.

A clear, thoroughly substantiated program for overcoming the formed difficulties is elaborated in the Basic Directions of National Economic Development, which were specified by the 26th CPSU Congress. The main thing in it is the emphasis on intensive factors: the growth of labor productivity, the increase of the effectiveness of capital investments, the utmost economy of resources. Nearly a year has passed since the party congress approved this program. How is it being implemented by our ministries?

According to the plan of last year labor productivity should have increased in industry by 3.6 percent, in construction by 3.5 percent and in rail transport by 1.6 percent. The actual increase was respectively 2.7, 2 and 0.8 percent. The ministries of ferrous and nonferrous metallurgy, the petroleum refining and petrochemical industry, the petroleum and coal industries are allowing an appreciable lag with respect to this most important indicator. Six industrial ministries of the RSFSR also did not fulfill the assignments on the increase of labor productivity. Why?

Let us recall what is well known: the intensification of production is impossible without the increase of its technical level. Specialists have calculated that nearly three-fourths of the increase of labor productivity is provided by means of the introduction and efficient operation of new equipment and advanced technologies. It appears that in some sectors they are obviously underestimating this mighty lever. Of course, it is not always possible to obtain, install and adjust more perfect equipment. But such a situation, in case of which new modern machine tools and devices remain idle for a long time, is hardly permissible. In the RSFSR Ministry of the Food Industry and the RSFSR Ministry of Local Industry, for example, one out of every four mechanized lines and one out of every five automated lines operated last year during one or less than one shift. About one-third of the enterprises included in the system of the RSFSR Ministry of the Construction Materials Industry due to low technical equipment also did not approach the planned level of labor productivity.

Intensification also requires, as is known, the effective use of capital investments. With reference to this factor the increase of the national income, which is approximately 1.5-fold greater than the increase of the capital investments, has been planned during the 11th Five-Year Plan. The 26th party congress indicated the means of achieving the goal: the utmost concentration of forces on the quickest possible completion and start-up of those enterprises which are capable of providing the greatest increase of output.

The practical experience of the work of last year attests: they are still not approaching the use of capital investments in this way in all sectors. In ferrous metallurgy the plan on the placement into operation of capacities for the production of coke was not fulfilled, in the chemical industry--the capacities for the production of mineral fertilizers, in the timber and wood processing industry--the capacities for the production of lumber. In the RSFSR the plan on the placement of fixed capital into operation fell short of fulfillment by 3.1 billion rubles.

As the analysis showed, the main reason for this is the frittering away of assets on secondary and unapproved projects. In the trusts of the RSFSR Ministry of Rural Construction, for example, selective checks during 9 months of last year identified 70 unplanned construction projects. For the ministry they had become too heavy a burden.

Both the inadequate growth rate of labor productivity and the low effectiveness of capital investments attest first of all to the fact that the executives of some ministries are obstinately using obsolete levers and stimuli of the management of production. "Precisely for this reason," Comrade L. I. Brezhnev said while addressing the November CPSU Central Committee Plenum, "one still has occasion to encounter such an economic situation, in case of which it is economically unprofitable for enterprises and associations to adopt stepped-up plans, to speed up scientific and technical progress and to increase product quality. Precisely for this reason it has not yet been possible to get rid of those indicators which in essence prompt wastefulness."

It would be possible to understand the wait-and-see position of the executives of some ministries, if new, more effective management methods did not exist today. More than 2 years have passed since the day that the CPSU Central Committee and

the USSR Council of Ministers adopted the decree on the improvement of the economic mechanism. This document commenced a new qualitative stage in the improvement of the planning of the entire system of the management of the national economy. Indicators, which reflect considerably more accurately the real contribution of each production or scientific collective to the meeting of the increasing needs of the national economy, are taking the place of the gross value indicators, which are oriented mainly toward the quantitative increase of production--without the evaluation of its efficiency and quality, which is now necessary.

Unfortunately, so far few ministries have adopted the new principles of management. Last year only 16 sectors decided to take the first step--they introduced in the system of planning the indicator of the standard net output. Even with allowance made for the 11 which will be added this year, only one-fifth of the output produced by industry will be evaluated according to this indicator. A little more than 20 ministries plan to take the second step--to use the standard method of the planning of wages and the profit. And this, very likely, is all from the vast number of effective stimuli, which have been developed by practice of recent years and found reflection in the decree.

Not by chance are the ministries trying to retain the old system of indicators, which is aimed at the "gross": if necessary it is possible by the overproduction of one product to cover the shortage of another. And this is being done in spite of the fact that the national economy is equally interested both in heavy-duty excavators and in ordinary thimbles. The USSR Ministry of the Petroleum Refining and Petrochemical Industry, for example, for 6 years has not fulfilled the assignments on the deliveries of lubricants. The executives of the sector cite more than enough causes which explain and even justify the disruption of production. But it is also impossible to ignore the subjective factor. In comparison, for example, with furnace fuel oil, the plans of the production of which are always fulfilled, lubricants are a "capricious" product which requires the strict observance of the technology and a greater interest of the production workers. It is the duty of the ministry to create the conditions for this, and the new economic mechanism offers the necessary economic levers in abundance. However, in the headquarters of the sector to this day they reject them, preferring customary measures in the form of orders. In the past 6 years the collegium of the ministry has discussed this problem at its meetings more than 20 times and has inserted in the minutes about 40 assignments which "strictly obligate" the managers of associations and enterprises to increase the output of the important product. So what? As before, the plans are not being fulfilled.

As the experience of enterprises attests, the obsolete system of the management of the economy also creates the conditions for such negative phenomena as additions and the adjustment of the plans. The check made last year by the organs of the USSR Ministry of Finance and the USSR Central Statistical Administration showed that the reporting data were distorted at 138 enterprises of the USSR Ministry of Light Industry. Last year the RSFSR Ministry of the Food Industry for three quarters in a row decreased the production plan for its Rosdiyetchayprom Association. Having been "lightened" by 37 million rubles, in the end it was considerably exceeded. It is easy to calculate the economic harm from such actions of the ministry. But what about the moral harm? The bonuses obtained by a dishonest means undermine the faith of people in the moral principles of the collective and in the need for persistent and conscientious labor.

Such facts become possible because some workers lack personal responsibility for the adopted administrative decision. This, in particular, pertains to the executives of the Ministry of the Machine Tool and Tool Building Industry, who, having drafted in February of last year "The Plan of Measures on the Improvement of the Work of the Ivanovo Machine Tool Building Association," did practically nothing for the timely fulfillment of its points. For this they were criticized in the article "The Unplanned Initiative." It would seem that this is a pretext for the party committee of the ministry to begin a large discussion about the responsibility of the communist for the assignment matter. The party committee, however, paid no attention to the publication of the newspaper. Such an approach to the style of work of the economic manager is intolerable. For the undesirable consequences of the errors and miscalculations, which have been made in the central organ of management, multiply on the scale of our economy. Much has been entrusted to the workers of the ministries. Consequently, the responsibility should also be the highest possible. How is this to be achieved? Let us remember V. I. Lenin: "...the priority task of the moment is not decrees, .../but the selection of people/ /in boldface/; the establishment of /individual responsibility for what is being done/ /in boldface/..."

The plans of the five-year plans are becoming more and more intense. The external and internal relations of the sectors are increasing and becoming more complicated. The coordinated work of enterprises and vigorous reorganization, which is aimed at the intensification of production, are an urgent task of our times. The active, fundamental stand of the party committees of the ministries and of each communist who works in the headquarters of the sector should contribute to its accomplishment. Relying on the great and diverse experience of the management of the economy, the party committees should increase considerably their influence on economic activity. The party program documents speak of this. Such is the requirement of life itself.

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INDUSTRIAL DEVELOPMENT AND PERFORMANCE

STRUCTURAL IMPROVEMENT OF SOCIAL PRODUCTION

Moscow PLANOVYE KHOZYAYSTVO in Russian No 11, Nov 81 pp 37-45

/Article by Doctor of Economic Sciences Professor S. Kheynman: "The Basic Directions of the Improvement of the Structure of Social Production"

/Text/ The 26th CPSU Congress set the task of changing over the economy to the primarily intensive means of development and noted the great importance of a long-term structural policy. In the Accountability Report of the CPSU Central Committee it is indicated: "Today, looking ahead 5, 10 years, we cannot forget that the national economic structure, with which the country will enter the 21st century, will be established and created precisely during these years."¹

In the documents of the congress and the decree of the CPSU Central Committee and the USSR Council of Ministers "On Stepping Up the Work on the Economy and Efficient Use of Raw Material, Fuel, Energy and Other Material Resources" the most important structural changes which occurred in the 1970's are analyzed and the main directions of the structural policy are indicated.

The structural policy is called upon, on the basis of the formed trends and the forecast of the foreseeable trends of the development and improvement of the structures of production and social needs, the potentials of the scientific and technical revolution, the consideration of foreign relations and the international situation, to determine the main proportions, which combine the components and subsystems of social production, as well as the means of changing their content and functions. It should ensure: the dynamic conformity of the structures of the final product and social needs; the implementation of the technical policy; an effective structure of the fuel and power base, the production apparatus, the raw materials and materials being used, the technology; the maintenance of progressive proportions in the development of sectorial complexes and their internal structure; the ability of the economy to utilize the achievements of the scientific and technical revolution; the accomplishment of progress of the division of labor, specialization and cooperation; the formation of efficient and economical territorial proportions for the complete utilization of the productive forces of every region with the most effective solution of all-union problems.

1. "Materialy XXVI s"yezda KPSS" /Materials of the 26th CPSU Congress/, Moscow, Politizdat, 1981, p 44.

The realization of the named aspects is aimed at the balanced development of the economy, the acceleration of scientific and technical progress and the maintenance of the reserves of means of production and consumer items at the necessary level. It also provides for the optimum production relations, the preservation of the end results and the minimization of losses at all the stages of the process of the reproduction of the national product.

The overcoming of the inertia in the development of production--equipment, technology--and in organization is no less important a task of the structural policy. The formed structure of production, product assortment and production relations are the vehicles of these trends. Only the consistent and strict pursuit of the technical and structural policy, which is based on nondecreasing state reserves and balanced plans, can withstand such phenomena and create the conditions for the planned replacement and updating of the production equipment and output, as well as the completion of the changeover of the economy to the intensive means of development. Consequently, the structure of social production for the most part should be a set object of planning and should be determined by the base proportions of the plan.

Structural Factors of the Present State of the Economy

Significant changes in the structure of the USSR economy were noted in the 1970's: with a 1.55-fold increase of the used national income the volume of industrial production increased 1.78-fold. The sectors ensuring the retooling of social production developed especially rapidly (electric power engineering--1.79-fold, machine building and metalworking--2.56-fold, instrument making--3-fold, the production of computer hardware--9.8-fold, the chemical and petrochemical industry--2.2-fold). The scale of the operation of the basic sectors of the infrastructure increased.

As a result, the material and technical base of the Soviet economy was strengthened substantially. The fixed production capital of the country increased 2.16-fold, having been augmented by new, more modern equipment. The USSR took first place in the world in the production of a number of most important industrial and agricultural resources.

Along with these indisputable achievements there were also certain difficulties. "Vast assets," L. I. Brezhnev indicated, "are being invested in the national economy.... But then we are obtaining a smaller end result than we should, than our potentials permit. Hence the disproportions, deficits, inadequate reserves."²

During 1961-1970 and 1976-1980 the average annual growth rate was: 9.0 and 7.3 percent for fixed production capital, 7.1 and 4.2 percent for the produced national income, 6.4 and 3.9 percent for the used national income. The cited data on the dynamics of the national economy do not reflect entirely accurately the real amounts of the end results of production. The output of industrial and agricultural production, which for various reasons, including reasons of a structural

2. L. I. Brezhnev, "Rech' na Plenum Tsentral'nogo Komiteta KPSS 27 noyabrya 1979 goda" /Speech at the CPSU Central Committee Plenum on 27 November 1979/, Moscow, Politizdat, 1979, p 9.

nature (shortcomings of designs and technology, the slow development of the infrastructure, weak capacities of enterprises for the processing of agricultural products), did not get to the consumer, is taken into account in the composition of the produced national income. In the calculations of the used national income a portion of these losses is excluded.

In the decree of the CPSU Central Committee and the USSR Council of Ministers of 30 June 1981 it is noted that as compared with the best world indicators in our country more raw materials and energy are consumed per unit of national income. The factors of such a disparity between the expenditures and results, including the factors connected with the structure of production, are also indicated, and the basic measures of the comprehensive program of the elimination of the noted shortcomings are outlined.

The discrepancy of the dynamics of the resources and the results in many ways results from the low technical level of the resources. Its steady increase is one of the main tasks of the growth of the national economy. But, in our opinion, the structural factors, which had formed in the Soviet economy by the early 1980's, have a substantial influence here. The identification of these factors, their analysis and the elaboration of proposals, which are conducive to the solution of the problems connected with them, are an important constructive task when formulating the economic policy of the party. Here, it seems to us, the following should be singled out as the key problems:

the development in the structure of social production of the links, which ensure the preservation and realization of the output, up to a level which is equal to the amounts of the produced national product;

the extraction of all (or the maximum possible) components from all recovered raw materials;

the bringing into dynamic correspondence of the capacities for the processing of raw materials and the volumes of their extraction (with allowance made for the seasonal nature of receipt and the storage life);

the use of the bulk of production resources under the conditions of specialized production which corresponds to the present potentials of science and technology;

the gradual decrease and elimination of the structural links which by their nature should have an extensive set of poorly used equipment;

the achievement of the optimum ratio between the technical parameters of the means of labor (all the produced equipment) and the objects of labor, which are worked by this equipment;

the improvement of the structure of the main sectorial complexes for the purpose of obtaining a high yield per unit of resources.

The main national economic characteristics of intensification and the means of their realization should be revealed in the structural policy. The criterion of intensification is the obtaining of that cumulative effect "expenditures--output,"

in case of which the results of production lead the aggregate expenditures on it and an economy of the latter is achieved. The most important aspect of intensification, which has a direct bearing on structural decisions, is the economy of aggregate expenditures not only for the producer, but also for the consumer of this product. The largest end national economic effect is ensured when the demands of the consumer receive priority. The objective evaluation of the process of intensification on the national economic level presumes the evaluation of the level of the preservation of the national product. The erroneous attempts to neutralize the effect of losses not by the elimination of the causes giving rise to them, but by the increase of the volumes of production of the output are frequent in practice.

In this connection the more detailed analysis of these problems and the means of solving them seems expedient.

The Development of the Infrastructure and the Reduction of Losses of Output

Before increasing the production of any resources which are presently being lost, it is necessary to implement measures to eliminate the losses. A significant portion of the losses is caused first of all by the inadequate development of the production infrastructure, especially transportation, which was discussed at the 25th and 26th CPSU Congresses. The poor technical equipment of enterprises of material and technical supply and procurement (elevators, storehouses of agricultural produce, fertilizers and toxic chemicals) is also appreciable. The supply of packaging, which depends first of all on the acceleration of the growth of the pulp and paper industry and the production of polymeric packaging materials, requires serious improvement. The large consumption of lumber for packaging (approximately 25 million m³) is not offsetting the shortage of cardboard and polymeric packaging. The production of materials-handling equipment requires a significant increase of the scale, the increase of the technical level and the improvement of organization.

The preferential development of the production infrastructure, in our opinion, is called upon to promote a significant reduction of the losses in the national economy. Thus, the road system lags most noticeably behind the requirements of the national economy. Roads with a good surface make it possible to increase the average speed of trucks from 30 to 70 km/hr, which will provide a greater impact than the use of an additional number of trucks. For their quickest possible construction a number of problems have to be solved, in particular, the production of the most modern road construction equipment and materials for road surfaces, roadbeds and so on has to be organized.

The modular (from standardized units and blocks) construction of warehouses and other storehouses, refrigeration systems, as well as the production of packaging provide a great impact. The increase of the volumes of agricultural production should also be accompanied by the leading development of the material and technical base of the storage of agricultural produce.

It is also necessary to solve the problems of the organizational structure of the basic sectors of the infrastructure and to eliminate the dispersal of the assets for its development among numerous departments and even individual associations and enterprises.

All these are structural alternatives, in the case of which the decision on the choice should be determined by the policy of intensification.

The Complete Utilization of Extracted Resources

The increase of the complete processing and the more complete utilization of primary raw materials are a problem of great importance. In the decree of 30 June 1981 it is noted that during the mining of minerals a significant amount of ore, coal and petroleum is not extracted from the ground. Production waste and secondary resources are being poorly utilized. For example, the fluxed sinter obtained from the slags of the agglomerated blast-furnace process and steel founding contains 45-52 percent iron. This recovery could save in the sector up to 40 million tons of first class ore a year. In the waste products of thermal electric power stations ash with a large amount of vanadium is formed when sulfurous fuel oil is burned. The developed methods of recovering the ash waste are affording an opportunity to annually obtain additional tens of thousands of tons of the most valuable alloy-forming agent.

The losses connected with the incomplete utilization of raw materials are great. The implementation of technological and technical decisions is of paramount importance for their elimination. Organizational structural factors also play an important role. Due to departmental limitation in the process of mining ferrous metals considerable amounts of nonferrous metals remain in the tailings. Nearly half of the iron, a third of the copper and a negligible portion of the aluminum and zinc are being returned for reuse first of all for organizational reasons. A similar situation is also forming with the processing of the waste products of thermal electric power stations, metallurgy, the food and sugar industries, wine making and other sectors.

In practice the incomplete utilization of raw materials is connected, perhaps, to the greatest extent with the fact that in ~~the determination~~ of the potentials of every deposit and the structure of the output of the corresponding departments the assignments on the extraction of all the useful components from the raw materials did not become a part of the plan. The shortcomings in pricing also have an effect. The low valuation of secondary resources does not interest enterprises in their realization.

The need to solve the structural problems, which are connected with the efficiency of the use of the obtained base resources, is also obvious with respect to agriculture. Thus, the capacities of the enterprises for the processing of sugar beets do not ensure the timely processing of all the raw materials being received in the time which guarantees the complete yield of sugar. The industry for the processing of potatoes and tomatoes, for the production of canned fruits and vegetables and so on is just as extremely inadequately developed.

The reserves in the area of the use of other useful components of agricultural raw materials and the products of their processing are also considerable. For example, in the sugar industry during the processing of the sugar beets about 70 million tons of beet pulp are formed annually. A large portion of its useful substances is lost during storage. Of the 800,000 tons of sunflower seed husks 200,000 tons are used by the hydrolytic industry, the rest is used for fuel. This

signifies losses of 65,000 tons of nutrient yeast and 20,000 tons of furfural. With the complete use of the byproducts of wine making it is possible to obtain about 3 million dal. of ethyl alcohol, 4,000 tons of tartaric acid, 12,000-13,000 tons of grape seed oil and 100,000-110,000 tons of fodder meal and granulated fodders.

The solution of the problem of the complete utilization of all the components of extracted raw materials and materials requires such organizational prerequisites as the introduction of a fee for resources. When making a geological evaluation of resources all the components (basic and secondary) contained in them should be taken into account. The standards of the fee should stimulate their complete extraction, even in instances when the secondary components (nonferrous metals in iron ores and so forth) do not correspond to the departmental specialization of the extracting organization.

The bringing of the investments in the industry for the primary processing of agricultural raw materials in line with their increased amounts in agriculture as a whole seems urgent. It is necessary to solve this problem, in our opinion, even by the redistribution of the assets allocated for the development of the agro-industrial complex.

"One's Own" Works and "One's Own" Services

The tendency to develop "one's own" works--the so-called natural economy--is a significant structural factor which impedes the solution of a number of problems of the organization of production. This was discussed at the 25th CPSU Congress. "Many economic managers," L. I. Brezhnev noted, "are themselves striving to provide themselves with almost everything--this, they say, is more reliable, since 'someone else's' suppliers can let us down.... But one must combat this, increasing discipline, and not stimulating the tendencies to a natural economy and departmental limitation."³ The indicated tendencies lead to an increase of the expenditures of living and embodied labor, and first of all to the unjustified increase of the pool of equipment. "One's own" poorly specialized works, in producing a large number of different products in a small quantity, and often on a custom scale, should inevitably have a set of all types of equipment which is not completely loaded. Not by chance did the average operating time of electric motors a year from 1960 to 1975 for all USSR industry as a whole decrease by approximately 4 percent, and in machine building and metalworking by 25 percent.⁴ It is obvious that the worse equipment is used (in time and with respect to capacities), the greater the need is for it and accordingly the more excessive the increase of the pool of equipment is.

3. "Materialy XXV s"yezda KPSS" [Materials of the 25th CPSU Congress], Moscow, Politizdat, 1978, p 45.

4. The latter data characterize the state of affairs at plants of machine building and metalworking. The equipment of the machine shops and works at non-machine building plants is not included here, but nearly half of the pool of machine tools of the country is concentrated at them.

A similar situation has formed in logging in sawmill production. All the mini-timber managements have a complete set of the necessary equipment, including electric motors. Given the small volumes of output it is essentially surplus, since it is used negligibly. The ministries' and departments' "own" motor pools and those of other organizations account for 70 percent of the total freight turnover of motor transport. An enormous fleet of poorly used vehicles and various equipment at a large number of minigarages are concealed behind this figure.

The repair of the active portion of the means of labor is also performed to a considerable extent by the enterprises' own forces. In addition to the shortage of spare parts, at the enterprises and associations of production machine building the warranty maintenance and repair of the equipment produced by them (machine maintenance service) have still not been brought everywhere into a system. An enormous pool of metalworking equipment and several million metalworkers, who are scattered among ancillary shops and services, are engaged in repair work. As a rule, it does not ensure either a high productivity or the proper durability and reliability of the repaired equipment and, moreover, requires considerable manual labor.

At present about one-fourth of the total number of people (3.2 million) engaged in manual labor in industry are used for repair work. The role of "one's own" department in the supply of machine building with tools and technological accessories is significant. Tools and technological accessories (which are expensive and far from high quality) are produced extensively in the tool shops of machine building plants, with a large pool of equipment and numerous skilled personnel. The causes of this situation are connected with the fears of not receiving in good time shipments under subcontracting arrangements, which prompts managements to cater "to themselves." Cooperation, as an important link of the economic mechanism, lags behind the intrasectorial and intersectorial relations, which are characteristic of modern production and are becoming complicated. The established incentives and penalties do not guarantee the observance of the time parameters of the output and delivery to the consumer of this product.

The planned replacement of a significant portion of "one's own" works with specialized works is one of the most complex problems of the structural policy. The implementation of the following structural measures in this area, in our opinion, may contribute to its solution:

the complete supply, which is legalized in a standard, is set down in the plans, is guaranteed in the case of the sale of equipment and is strictly controlled, of all production equipment for the entire period of its operation with a complete set of replaceable and repair parts and assemblies, as well as parts and assemblies for the subsequent modernization of the equipment;

the introduction everywhere of a system (and its provision with the necessary staff, equipment and wage fund) of warranty maintenance and repair--a machine maintenance service--in the case of the output of all types of production equipment;

the preferential development in the system of intersectorial works, enterprises and sectors of functional specialization. The capacities of this complex of enterprises should be systematically increased annually;

the formation in machine building and metalworking, as well as metallurgy, wood working and other sectors of small enterprises or subdivisions at existing enterprises and associations, which are capable of accepting for filling the orders of enterprises and scientific research institutions of various sectors for nonstandard, special equipment in one or several copies, as well as for any services.

In ferrous metallurgy the small-capacity plants would be able to produce a small-tonnage assortment of rolled products, having freed metallurgical giants from frequent readjustments; to meet more flexibly the demand of machine building for a wide assortment of sectional sizes and thereby to decrease the volume of shipments of metal and scrap metal.

With the increase of scientific and technical progress and the scale of production the process of specialization affects not only the production of various types of output. It becomes to a greater and greater degree the specialization of the very means of production, which manifests itself in the development and use of specialized, multiposition and multifunctional types of equipment, specialized means of transportation and equipment which is tailored for different natural conditions (in northern, tropical designs). This also pertains to the objects of labor: synthetic materials with set properties, various alloys and others are appearing. It is necessary to stimulate this process, while displaying, however, flexibility and steadfastly ensuring production efficiency.

The indicated problem is of substantial importance for agriculture. The development of heavy-duty industrial fodder production, the specialization and improvement of the breed of productive livestock and the further development of breeding in plant growing should become distinctive traits of agricultural production. A sharp increase of the technical level and capacities of the industry for the primary processing of agricultural raw materials is also necessary. Such changes along with the development and improvement of a number of sectors of heavy industry and sectors of the production infrastructure will create the basis of the operation of an efficient agro-industrial complex.

The Orientation Toward the Consumer and Redundant Capacities

The implementation of the instructions of the 25th CPSU Congress on the direction of the attention of producers toward the thorough consideration of the structure and amounts of the demands of consumers is an important direction of the structural policy and at the same time an essential condition of the changeover of the economy to the intensive means of development. The aspiration to produce a little more in series and to increase "one's own" efficiency often has the result that the producers, while systematically increasing the unit capacities of the equipment produced by them, do not take into account the requirements and peculiarities of the consumers. As a result, there are often cases of the use of capacities, which greatly exceed the real needs (for example, the hauling of freight in trucks with a considerably greater carrying capacity, the use of high-duty tractors in operations which require comparatively less horsepower and others).

Such a practice sharply increases the resource-output ratio of production and does not promote its intensification. The inputs of metal and labor in equipment increase, the level of the utilization of its technical parameters decreases, the

production cost increases and the output-capital ratio decreases. The great national economic importance of these problems advances as one of the important directions of the structural policy the assurance of the dynamic conformity of the power and size characteristics of the means of labor and any other product to the social needs which they are called upon to meet. The realization of this direction involves the organization of the systematic and differentiated consideration of the associated parameters and the reflection of the measures, which are necessary for the elimination of the identified disproportions and negative trends, in the national economic plan.

Intensification and the Improvement of the Structure of the Main Complexes of Heavy Industry

In the fuel and power complex the task of increasing the proportion of atomic energy, gas and coal has been set; the production of liquid fuel on the basis of coal will be rapidly developed. It is possible to count on acceptable decisions and the start of the commercial use of solar energy and such nontraditional sources as the wind, geothermal and tidal energy, as well as on the significant improvement of the technology of the generation of electric power. At the same time the solution of the problems of the substantial decrease of the labor intensity and capital-output ratio of the main sectors of the complex--the fuel industry and electric power engineering--is possible on the basis of advanced equipment and technology and the concentration of a considerable number of scattered small electric power stations and boiler houses.

The metallurgical complex has great possibilities for intensive development. The introduction of advanced equipment should be reflected in the gradual reduction of the open-hearth method of steel production (which has been sharply reduced in the United States and Western Europe and completely eliminated in Japan) and the transition to the predominance of the oxygen-converter and electrical-steelmaking methods of steel smelting, in the retooling of milling and especially "the fourth conversion," in the extensive introduction of the process of thermal hardening, the surface finishing of rolled products and anticorrosive coating. On this basis the qualitative characteristics of metal will increase substantially. The combination of the efficiency "for oneself" and for the consumer should find expression in the enlargement and the bringing in line with the requirements of the metal-consuming sectors of the assortment of rolled products, the increase of the proportion of sheet, including light-gauge sheet, and economical shapes with a significant increase of the number of sectional sizes of the rolled products being produced; in the stepped-up growth of powder metallurgy. This will ensure the decrease of losses in metallurgy itself and an even greater saving of metal for the consumers. At the same time the complete utilization of all the useful components contained in the ores of ferrous and nonferrous metals is necessary.

The petrochemical and chemical complex should undergo leading development, while within it the production of polymers will increase rapidly with a sharp improvement of their quality characteristics. Polymeric materials, given the present technical characteristics, can be used far from always for the production of domestic structural components of machines and equipment, that is, products which are of the largest tonnage and the most material-intensive. In 1985 the production of synthetic resins and plastics will come to 6.0-6.25 million tons (the

increase in 5 years will be 65-72 percent) and the production of chemical fibers will come to 1.6 million tons. By the end of the 1980's and in the 1990's it is possible to anticipate a significant increase of the proportion of polymers in the balance of construction materials. Large quantitative changes will also occur in the structure of agricultural chemistry. The 26th CPSU Congress especially singled out the task of increasing the output of small-tonnage chemical products (particularly of precision organic synthesis), which is an important factor of the acceleration of scientific and technical progress in an extensive group of sectors of physical production.

The coming period will be characterized by the leading development of machine building, especially its leading sectors--electronics, instrument making, the production of automation equipment and so on; by the radical improvement of the quality of the equipment being produced and a significant improvement of the organizational structure of the entire machine building complex and by the increase of the active role of machine building in the entire investment complex.

In machine building an increase of the production of replaceable and repair assemblies and parts for equipment, the accelerated development of the specialized production of tools and technological accessories, equipment for auxiliary processes, especially materials-handling equipment, for the supply of repair work and so forth is envisaged along with the increase of the output of highly efficient technological equipment. The need for the enlargement of the range of type sizes of equipment and its orientation toward the complete meeting of the requirements of consumers is becoming obvious.

The 26th CPSU Congress set the task to continue the expansion of the specialization of machine building production, the creation of new and the development of operating specialized enterprises and large shops, which produce blanks, parts, subassemblies and units for sectorial and intersectorial purposes. The implementation of this policy presumes the steady intensification of both the item and, to an even greater extent, the technological, parts and especially the functional specialization of production.

A serious problem is arising in connection with the item-sector structure of the majority of machine building ministries, which are oriented toward the development of a system of machines for sector-consumers. Since it includes technical devices, which are diverse in purpose and different in design, production technology and nature of operation, this principle of the organization of ministries is conducive in the case of the present structure of domestic machine building to the development of the production "by one's own forces" of all types of technical devices. The solution of this problem dictates the need for the development of enterprises and sectors of functional specialization.

The stated structural problems have a direct bearing on the balance of plans. The assurance of this balance is the basis of the structural policy, one of the most important prerequisites of the realization of all the directions of intensification.

An efficient structural, scientific and technical policy in the presence of a mighty scientific and technical potential, which was created by the dedicated labor of the Soviet people, will serve as an important factor of the accomplishment of the tasks advanced by the 26th CPSU Congress.

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INDUSTRIAL DEVELOPMENT AND PERFORMANCE

REPRODUCTION OF INDUSTRIAL OUTPUT

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/Article by Candidate of Economic Sciences M. Gorshkov, chief of a subdepartment of USSR Gosplan: "The Features of the Reproduction of Industrial Output During the 11th Five-Year Plan"/

/Text/ The 11th Five-Year Plan of USSR Economic and Social Development for 1981-1985 is a new major step in the development of the productive forces and the improvement of the production relations of mature socialism. The role of industry--the most important sector of the national economy, which produces more than half of the gross national product and the national income and has an enormous influence on the development of the material and technical base of all the sectors of the USSR economy--in the accomplishment of the tasks of the development of physical production will increase even more during this five-year plan.

It is outlined by the five-year plan to increase the volume of industrial output by 26 percent, including the output of group A by 25.5 percent and the output of group B by 26.2 percent; to carry out the further improvement of product quality; to link its output more closely with social needs. A leading role belongs to industry in the accomplishment of the tasks advanced by the 26th CPSU Congress on the assurance of progressive structural changes in the national economy and stable and balanced expanded reproduction. At the same time the accomplishment of these tasks during the 11th Five-Year Plan will take place under more complicated conditions than during previous five-year plans, which is due to the limited increase of manpower resources, the further worsening of the geological mining conditions of the extraction of the main types of minerals, as well as to the limitation of capital investments.

Therefore coordinated measures on the acceleration of scientific and technical progress, especially on the development and introduction of new types of equipment and technology, which ensure an increase of labor productivity, the economy and the reduction of the losses of raw materials, materials, energy and other resources, the better use of productive capital and the increase of the quality and reliability of products, are envisaged by the five-year plan. In order to increase the production potential of industry it is necessary to ensure the retooling of the base sectors of industry and the improvement of its proportionality by the elimination of intersectorial and intrasectorial disproportions and the more complete utilization of the already available production capacities. The most

important task is the improvement of the balance of the development of industry on the basis of the more thorough determination of social needs for individual types of products and the stability of the resource section of the balances, the fulfillment of the outlined assignments on the economy of material resources.

The assurance of an accelerated growth rate of the output of group B of industry requires a substantial increase of the production capacities of these sectors: the increase of the deliveries of raw materials, materials and equipment, which are necessary for the enlargement of the assortment and the increase of the quality of consumer goods.

The qualitatively new tasks set for industry require a detailed analysis of the peculiarities of the reproduction of industrial output, the elaboration and implementation of measures on their practical accomplishment. One of the most important problems of the 11th Five-Year Plan is the provision of the conditions for the further increase of the production of the means of production, which are necessary for the growth of the economy both during the 11th Five-Year Plan and beyond it. Here it is necessary to take into account that the envisaged lead of the growth rate of the output of group B of industry as compared with group A will entail an increase of the proportion of the output of subdivision I, which is allocated for the development of subdivision II of the national product, which, of course, decreases even more the resources of subdivision I, which are allocated for its development. The solution of the problems of the reproduction of the means of production and the development of the base sectors of industry is extremely important for the achievement of the proportionality of the development of the economy of the country.

As is known, in addition to the output of group A of industry, the output of construction, agriculture, transportation and other sectors of physical production, which is used for the creation of fixed production capital, is included in subdivision I of social production (the production of means of production). However, the output of group A of industry constitutes an overwhelming portion of the output of subdivision I. In the case of the extensive nature of reproduction the leading development of subdivision I, including group A of industry, was ensured mainly by the considerable increase of capital investments and their material backing. In the case of the increase of the processes of intensification technical progress is having a greater and greater influence on the nature of production. It finds expression, in particular, in the fact that the productivity of equipment--its ability, as K. Marx noted, to replace living manpower--is increasing more rapidly than its cost and monetary expression in prices. Consequently, the increase of the production of the tools and means of labor and of their consumer properties will be guaranteed more rapidly as compared with their value expression. With the acceleration of scientific and technical progress these processes will have an increasing influence on the reproduction of industrial output. During the 11th Five-Year Plan it is planned to assimilate 19,500 new descriptions of machines, equipment and materials as against 17,500 during the 10th Five-Year Plan. The rate of replacement of equipment will increase 1.5- to 2-fold, while the productivity of new machine tools and transfer lines will increase 1.5- to 1.6-fold. The productivity of other types of new equipment will also increase substantially. This will make it possible to ensure a high growth rate of the base sectors of industry: the fuel and power complex, machine building, construction materials, with the above-noted complications in the development of industry.

In the end owing to this an opportunity was afforded to decrease the need for resources of capital investments, which are necessary for the achievement of the outlined growth rate of the national income as against the Ninth and 10th Five-Year Plans (table).

	(percent)		
	By five-year plans		
	Ninth	10th	11th
National income.	128	121	118
Capital investments.	142	129	110.4
Increase of capital investments per percent increase of the national income, percent	1.11	1.07	0.94

The pursuit of the policy of the intensification of production, which was outlined by the 26th CPSU Congress, given the indicated peculiarities of the reproduction of the national product, the national income and the output of industry, will require the consistent pursuit of an investment policy which is aimed at the acceleration of scientific and technical progress, especially the assimilation of new equipment; the further improvement of the structure of production; the search for means of increasing production efficiency, first of all in the raw material sectors of industry; the utmost economy of raw materials, fuel and materials; the increase of labor productivity.

First of all it will be required to increase the assets being allocated for the retooling and renovation of operating enterprises, which will make it possible to accomplish a number of interrelated tasks in the extractive and processing sectors of industry on the increase of production capacities with fewer specific capital investments. First of all the replacement of obsolete equipment will make it possible to decrease the need for manpower as a consequence of the increase of the level of automation and the production of new equipment (by 1.5- to 2-fold). Labor productivity will also increase as a result of the decrease of the downtimes and the reduction of the breakdowns of equipment which has great physical wear. Of course, under the conditions of a shortage of manpower these measures are exceptionally important for the assurance of the planned increase of labor productivity in industry and the proportion of the growth of output due to the increase of labor productivity. As is known, these assignments are more intense than during the 10th Five-Year Plan. Labor productivity in industry should increase by 23 percent as against 17 percent during the 10th Five-Year Plan, while the growth of output due to this should increase by 90 percent as against 75 percent.

The implementation of the measures on the increase of the effectiveness of capital investments, which were outlined by the 26th CPSU Congress, has its own peculiarities in the processing and extractive sectors of industry. In the processing sectors this is the priority allocation of assets for the retooling and renovation of operating enterprises, which speeds up their recovery on the average by threefold; the restriction of new construction and the reduction of the amount of unfinished construction. In the extractive sectors, to which a significant portion of the capital investments is being allocated, this is the improvement of the equipment and technology of the working of mineral deposits and the complete utilization of all the components of the ore (it should be taken into account that during the

11th and 12th Five-Year Plans the content of metal in the ores of the majority of nonferrous metals will decrease by 10-15 percent, for ores of ferrous metals-- 12-15 percent, the proportion of ores which are hard to concentrate with respect to the ores of nonferrous metals will increase by 20-25 percent, which will entail an increase of the processing of the body of rock, as well as of the capacities for the concentration of the ore). For the assurance of the outlined increase of the production of ferrous and nonferrous metals there are needed: powerful equipment for the stopes, a system of continuous transportation, heavy dump trucks and other highly productive equipment. Thus, the volume of the mining of ores in nonferrous metallurgy by means of sets of self-propelled equipment during the five-year plan will increase 1.4-fold, which will make it possible to increase the labor productivity of miners by twofold. The improvement of the technology of concentrating ores (in heavy suspensions, foam separation and others) will speed up the process of concentration and the more thorough and complete utilization of the useful components of the ore. The acceleration of the development of heavy machine building, which supplies a significant portion of the equipment for the mining industry, is a most important prerequisite for the implementation of these measures.

The reproduction of the national product and industrial output to a considerable extent depends on the development of the fuel and power complex, the change of its structure by the rapid increase of the production of gas and the open-cut mining of coal, as well as measures on the economy of fuel and electric power, which will decrease somewhat the need for capital investments and material resources. For this in the petroleum industry there is envisaged an increase of the amount of the physicochemical actions on petroleum beds for the increase of their petroleum yield by the injection of steam, carbon dioxide, high-pressure gas, surfactants, polymerization flooding, intrabed burning. In the gas industry new methods of the intensive recovery of gas, its complete preparation at the fields and the improvement of the methods of transportation will find extensive application. In the coal industry the open-cut mining of coal with the use of heavy-duty equipment, which by 1985 will provide nearly half of the coal, will increase. In underground mining the use of automated sets of stoping equipment (for the removal of coal without the presence of people at the faces) and sets of drilling equipment, which make it possible to mechanize all the operations of the drilling cycle, including the supporting of the mine workings, and increase the productivity of the mining brigades by several times, will increase. Here it should be borne in mind that since fuel and electric power in industry, especially in the raw material sectors, act as elements of the processing method, the needs of industry for fuel and energy resources (with allowance made for their economy) should be fully met, otherwise the shortage of these resources will check the development of both the raw material and processing sectors and of industry as a whole.

Progressive changes in the structure of industrial production, which are connected first of all with the more rapid growth of the sectors which ensure technical progress--machine building, the chemical and petrochemical industry, the share of which it is planned to increase from 35 percent in 1980 to 38 percent in 1985-- will be of substantial importance for the assurance of the reproduction and economy of resources. The growth of the production of machine building products and new equipment and the increase of their technical level will make it possible to boost the production of tools of labor and to increase their productivity by the

expansion of the production of large-capacity units and of equipment for fundamentally new technological processes. Along with the other measures this will make it possible to ensure the increase of production capacities with limited amounts of capital investments. The balance between the production of the output of machine building and the need for it can be improved considerably by the use of the surpluses of uninstalled equipment and the closer coordination of the plan of the production of equipment with the construction and renovation of enterprises and projects so as not to permit the formation of such surpluses in the future.

Progressive changes in the output of individual types of products, including the change of the structure of the production of construction materials, of which the output of synthetic resins and plastics, particle and fiber boards, laminated wooden components, as well as economical types of rolled ferrous metal products will increase more rapidly, will be of great importance for the achievement of the same goals.

The progressive changes in the nature of the reproduction of industrial output, which are outlined in the five-year plan, the improvement of the structure of production, the expansion of the output of efficient types of products, the economy of material resources, as well as other measures on the increase of production efficiency will make it possible to ensure the outlined growth rate of labor productivity and the decrease of the production cost by 1.3 percent as against 1 percent during the 10th Five-Year Plan. In industry 28 percent of the increase of the profit will be obtained due to the decrease of the production cost as against 26 percent during the 10th Five-Year Plan.

It is envisaged by the five-year plan to increase the output of group B by 26.2 percent, of it cultural, personal and household goods by 1.4-fold, the output of light industry by 19 percent and the output of the food sectors of industry by 22 percent. The achievement of a high growth rate of the output of group B to a considerable extent depends on the supply of the sectors, which produce consumer and agricultural items, with the appropriate types of equipment, fuel and other material resources, which are produced by the sectors of group A of industry. The strengthening of the social orientation of the plans was responsible for the increase of attention to the development of the production of consumer goods, as a result of which material and other resources are being allocated for these purposes on a priority basis. Thus, in the distribution of capital investments the allocation to agriculture of 27 percent of the state capital investments with the backing with the necessary material resources is envisaged.

The considerable increase of the delivery of modern equipment to the sectors of light and the food industries, which will make it possible not only to boost the output of products, but also to increase considerably their quality, is outlined in the plan. Thus, during the 11th Five-Year Plan it is planned to develop and begin the production of highly efficient systems of machines and equipment, which ensure the mechanization and automation of technological processes, the complete utilization of agricultural raw materials, the reduction of losses during their processing, storage and delivery to the consumer, as well as the improvement of the quality and the enlargement of the assortment of the output being produced. A high rate of the production of equipment for light and the food sectors of industry will make it possible to increase considerably the capacities for the

processing of agricultural products, especially perishable products, in conjunction with the outlined increase of agricultural output.

The proportion of industrial raw materials, which are allocated for the production of consumer goods, will increase considerably. For light industry 36 percent more artificial and synthetic fibers and filaments will be produced, the production of dyes and materials for the finishing of fabrics, leather and other items will be expanded. The allocation of metal, plastics and other types of raw materials will be increased for the assurance of the increase of the production of cultural, personal and household items. Here the assimilation and increase of the production of technically new types of goods (cassette tape recorders, automatic washing machines, transistor televisions and others) are assuming substantial importance for the economy of material resources and electric power, which will be of great importance for the balancing of many types of material resources and the decrease of the need of municipal services for electric power.

The stability of the increase of the output of group B to a considerable extent depends on the supply of the corresponding sectors with industrial, and especially agricultural, raw materials. For this purpose in agriculture it is planned to increase considerably the capital-labor and power-worker ratios, to increase the deliveries of tractors, agricultural machinery and other equipment, which will make it possible to perform operations during the best agronomic periods, to increase the areas of reclaimed lands which yield stable harvests, as well as to reduce the losses of agricultural produce.

The growth rate of industrial production, which is outlined by the five-year plan for 1981-1985, is impossible without the prompt making of interdependent deliveries of products between the reproductive subdivisions of industry, as well as other sectors of the national economy--agriculture, capital construction, transportation, which have a great retroeffect on the development of industry. It should be noted that in the case of an intensive nature of reproduction the rigidity of the indicated interrelations increases, since the increases of production in agriculture, construction and transportation also depend on the machine-worker ratio, that is, the deliveries of the appropriate types of industrial output. Of course, this does not belittle the need for the search for reserves of the increase of production by means of its better organization, the reduction of all types of losses and the more efficient use of capital at the enterprises and organizations of all the sectors of the national economy.

The reproduction of industrial output is inseparably connected with the consistent implementation of measures on the increase of the efficiency of industrial production and the level of its organization. A set of measures on the assurance of the increase of labor productivity, the decrease of the materials-output ratio of production and the improvement of the indicators of the output-capital ratio is envisaged during the 11th Five-Year Plan. The main thing during the accomplishment of these assignments consists not in the provision of the material basis of the improvement of these indicators, but in their consistent fulfillment from the point of view of both the production of the appropriate types of equipment and their introduction at every enterprise and in all ministries.

The assurance of the increase of labor productivity is one of the most important tasks of the increase of production efficiency, which is due to the need to obtain the bulk of the increase of the national income (90 percent) by means of this factor. Its practical accomplishment in many ways depends on the implementation of the comprehensive programs of the reduction of manual labor. In industry alone it is planned to free from difficult and monotonous operations 1.2 million people and to assign them to other sectors of production. Other measures on the introduction of new equipment and technology, particularly the considerable expansion of the production of manipulators (industrial robots), numerical control machine tools and processing centers, the use of computers for the control of technological processes and in automated control systems, will also have a great influence on the increase of labor productivity.

The attention in all sectors of production to the questions of the reduction of the materials-output ratio of industrial production should be increased in connection with the increase of the cost of raw material resources. The introduction of a low-waste and waste-free technology, efficient types of rolled metal products and substitutes of critical types of materials, the decrease of the weight of machines and devices and the improvement of the production technology in machine building alone can provide a saving of 8.5 million tons of rolled ferrous metal products. The assignments on economy encompass a large portion of the material resources and are just as obligatory as the assignments on the volumes of the production of industrial output.

The elimination during the five-year plan of the formed intrasectorial disproportions in the chemical industry, ferrous metallurgy and other sectors, which are responsible for the incomplete loading of capacities and the increase of the cost of output as a consequence of the attribution of the total amount of the amortization deductions to smaller volumes of output, is of great importance for the improvement of the indicators of the output-capital ratio. In machine building an urgent problem is the increase of the shift coefficient, which in many ways depends on the mechanization of labor at preparatory and ancillary works and the transfer of the workers being released to the main shops.

The implementation of these measures is impossible without the improvement of the economic mechanism and the increase of the influence of financial indicators on the need to carry out the technical rearrangement of production. Among these measures there should first of all be noted the standard method of the formation of the wage fund and the use of the profit, the change of the conditions of the payment of bonuses for the delivery of products according to contracts and orders, the changeover beginning in 1982 of all ministries to the evaluation of activity according to the standard net output and the improvement of the physical indicators for individual types of output. They are all aimed first of all at the finding and utilization of the internal reserves of the increase of production. Experience shows that new indicators yield the greatest impact with their gradual implementation from top to bottom. In this, in particular, lies the success of the work of the Ministry of Instrument Making, Automatic Equipment and Control Systems, which fulfilled the assignments of the 10th Five-Year Plan. However, some ministries, when there is any irregularity in production, advance demands for a change of the standards, as a result of which they become economically meaningless and adversely affect the end results.

The tasks set by the 26th CPSU Congress on the intensification of the development of industry and the enhancement of its role in the reproduction of the national product and the national income, as was shown above, are backed by a system of economically sound measures on the effective use of capital investments and the acceleration of technical progress in all sectors and at all works and by the improvement of the system of indicators and economic standards. The experience of a number of ministries (the Ministry of Instrument Making, Automation Equipment and Control Systems, the Ministry of the Gas Industry, the Ministry of Chemical and Petroleum Machine Building) and leading enterprises confirms that the consistent implementation of these measures, the search for and utilization of internal production reserves ensure the delivery of products in conformity with contracts and orders, a high growth rate of production and its efficiency and the steady improvement of economic indicators. At the same time in many ministries, especially of the raw material sectors of industry, it is necessary to increase considerably the level of the organization of production, to establish more efficiently the ties with related sectors, first of all with transportation and construction organizations, and to strive for the fulfillment everywhere of the plan in accordance with all contracts and orders.

The progressive changes in the structure and nature of the reproduction of industrial output, which have been outlined for the 11th Five-Year Plan, are in keeping with the state and prospects of the development of the productive forces and production relations of the mature socialist society, and their accomplishment for the most part depends on the stepping up of the organizing work on the assurance of the intrasectorial and intersectorial ties and the proportions of industrial production.

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INDUSTRIAL DEVELOPMENT AND PERFORMANCE

CONCENTRATION OF INDUSTRIAL PRODUCTION, ECONOMIC DEVELOPMENT

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/Article by Doctor of Economic Sciences Professor I. Shilin: "The Concentration of Production and the Intensification of the Development of the Economy"/

/Text/ The consistent policy of the concentration of production is embodied in practice in the plans of USSR national economic development. In the Basic Directions of USSR Economic and Social Development for 1981-1985 and the Period to 1990 the task is set "to improve the forms of the organization of industrial production.... To increase the level of the specialization, cooperation and concentration of production."¹

Concentration is manifested in the sectorial and the territorial types. The most important forms of the former are the concentration of specialized production, concentration on the basis of the combination of interdependent works and concentration at general-purpose enterprises. The forms of territorial concentration are industrial centers, agricultural production centers, territorial production complexes and others.

In the course of the entire development of the socialist economy the increase of the concentration of production occurred, to which the data of Table 1 attest.

During the period in question the level of the concentration of production in industry increased substantially. The proportion of the first two groups of enterprises in the production volume decreased from 17.5 percent in 1968 to 9.7 percent in 1975 and in 1979 for 10 sectors was 5.1 percent. At the same time the proportion of the last two groups (large enterprises) increased accordingly from 37.7 percent to 52.2 percent and for 10 sectors came in 1979 to 62 percent. The fact that in the last group labor productivity is 5- to 11-fold higher than in the first group (1975 and 1979) attests to the influence of the concentration of production on the indicators of efficiency.

1. "Materialy XXVI s"yezda KPSS" /Materials of the 26th CPSU Congress/, Moscow, Politizdat, 1981, p 148.

Table 1

Grouping of enterprises by volume of gross out- put, thousands of rubles*	By years										
	Proportion of group of enter- prises in their total number, %		Gross output by groups of enter- prises, %		Labor productivi- ty per worker in respect to first group, %		Change of output- capital ratio in respect to first group, %				
	1968	1971	1975	1979	1968	1971	1975	1979	1968	1971	1979
To 1000	40.1	36.1	31.6	29.0	2.6	1.9	1.12	0.8	100	100	100
1001-5000	37.9	37.9	36.8	29.8	14.9	12.3	8.6	4.3	165	144	213
5001-10000	10.3	11.8	12.9	12.0	11.7	11.2	8.6	5.1	265	140	265
10001-50000	9.7	11.4	14.5	20.6	33.1	31.6	29.4	27.6	269	166	243
50001-100000	1.3	1.7	2.3	4.6	14.3	15.2	15.2	17.7	330	148	357
100000 and more	0.7	1.1	1.9	3.9	23.4	27.8	37.0	44.3	158	137	303

*The grouping includes in 1968, 1971 and 1975 the enterprises of all sectors of industry; in 1979 it includes 10 sectors of industry.

Let us examine the trends in the development of the sectorial concentration of production using the example of a number of sectors. The achievements of USSR electric power engineering, its technical level and great cost effectiveness have received wide recognition. The policy of building electric power stations with a high level of the concentration of production, which are notable for economy, made it possible to eliminate a vast number of uneconomical small electric power stations. The specific capital investments in USSR electric power engineering in the 1960's and 1970's were much less than in the United States. The consumption of fuel per kWh of released electric power decreased from 645 g of conventional fuel in 1940 to 468 g in 1960, 367 g in 1970 and 330 g in 1979. In the future the rate of the concentration of production in electric power engineering will increase. The average capacity of the thermal electric power stations being planned for construction is 360,000 kW. A qualitatively new phenomenon in power engineering is the changeover to the high-speed flow-line construction of series-produced thermal electric power stations, in case of which the most important indicators decrease in the following manner: the specific capital investments per unit of capacity--by 20 percent, the period of designing--to one-half to two-thirds, the labor expenditures in construction--by 40 percent, the number of operating personnel--to 0.57 person per 1,000 kW of capacity, the construction period--by 1.5-2 years.

The concentration of production in nuclear power engineering as the most important factor of the increase of its efficiency is of particular importance. During the 11th Five-Year Plan it is planned to put into operation nuclear electric power stations with a capacity of 24-25 million kW. Large AES's with a unit capacity of the reactors of 1 million kW and more will be built. Their specific metal content is 50 percent less, while the labor-output ratio is 30 percent less than their predecessors. The methods of high-speed flow-line construction are finding more and more extensive use in nuclear power engineering.

Prior to the 10th Five-Year Plan the level of the concentration of production in the USSR coal industry increased, but slowly. The average daily production per operating coal mine increased from 738 tons in 1940 to 1,687 tons in 1969, that is, 2.3-fold. In 1975 it was 2,866 tons and in 1979--2,623 tons.

In the petroleum industry the level of concentration depends not only on natural factors and the perfection of the equipment being used, but also on the introduction of new advanced methods, which ensure an increase of the coefficient of the petroleum yield of the beds. In this respect the greatest gains exist in Western Siberia. The skillful use of the factors of the increase of concentration are promoting the rapid increase of the production of petroleum and gas in Western Siberia. The production of petroleum in 1980 came to 312 million tons, while in 1985 it is planned to produce 385-395 million tons.

In the sectors producing consumer goods the economic advantages of the optimization of the level of the concentration of production are still being utilized inadequately, which affects labor productivity, the output-capital ratio and the profitability in these sectors and the quality of goods.

The effectiveness of the concentration of production on the basis of the example of light and the meat industries is reflected in Table 2.

Table 2

Enterprises with volumes of work, rubles	Labor productivity, cal- culated according to		Output-capital ratio, cal- culated according to		Expenditures per ruble of sold output
	gross output	net output	gross output	net output	
Light industry					
To 500,000. . .	100	100	100	100	100
500,000-1,000,000	44	155	121	109	96
1-5 million . .	226	245	169	116	86
5-10 million. .	327	298	212	121	85
10-50 million .	524	233	252	129	87
50-100 million.	753	262	335	136	86
100 million and more. . . .	997	193	406	143	88
Meat industry					
To 500,000. . .	100	100	100	100	100
500,000-1,000,000	298	114	601	243	42
1-5 million . .	511	176	528	193	41
5-10 million. .	998	363	1134	436	39
10-50 million .	1179	433	1278	500	42
50-100 million.	1315	372	1729	636	43
100 million and more. . . .	1315	461	2086	779	39

Along with the factors which increase the level of concentration, there are sectorial and regional factors which have an effect in the opposite direction. The latter are especially manifested in the sectors which process agricultural raw materials. In different regions of the country the optimum size of enterprises, which produce the same product, will be different. With the increase of the level of concentration the production of the finished product decreases in cost, but, other things being equal, the radii of the shipments of raw materials and finished products and, consequently, the transportation costs increase, the losses and unproductive expenditures rise. L. I. Brezhnev in a speech at the November (1981) plenum, in directing the attention of managers to the complete consideration of factors, noted: "The construction only of large enterprises for the processing of milk, the slaughtering of livestock and the processing of meat... is hardly justified. This also leads to losses and unproductive expenditures. It is necessary and possible to decrease them sharply."² The approach to the location and construction of elevators and mixed fodder shops should be similar.

In characterizing the influence of the concentration of production on the processes of the intensification of the development of the economy, it is important to note that it ensures the putting to use of large reserves, which at the same time are the least expensive with respect to expenditures, of the increase of production efficiency and is becoming under the conditions of the scientific and technical revolution an urgent necessity. Along with industry, concentration also encompasses such spheres of physical production as agriculture, construction,

2. PRAVDA, 17 November 1981.

transportation and the sectors of the nonproductive sphere, including scientific research activity. Concentration ensures the better use of manpower resources, fixed capital and the objects of labor. It has a complex effect on the labor intensity, capital-output ratio, materials-output ratio and capital intensity of production.

The present demographic situation is unfavorable in the majority of regions of the country. A shortage of manpower exists in many industrial centers. Under these conditions it is difficult to overestimate the importance of the increase of the concentration of production for the improvement of the use of manpower resources and the increase of labor productivity. In industry the labor-output ratio at enterprises with a production volume of up to 1 million rubles is 5-fold higher, while at enterprises with a volume of 1-5 million rubles it is 2.5- to 3.5-fold higher than at enterprises with an annual output in the amount of 100 million rubles and more.

The labor-output ratio at enterprises of the optimum size is several times less than at enterprises with a low level of the concentration of production. Therefore, the increase in the sectors of industry of the proportion of optimum enterprises, while decreasing the overall need for manpower, increases the level of the sectorial and social productivity of labor.

L. I. Brezhnev noted at the November (1981) plenum: "The root of evil is the slow reduction of manual labor."³ In industry and construction there are more than 15 million workers who are engaged in manual labor. The expenditures connected with the mechanization and automation of manual labor yield the greatest economic and social impact at enterprises with a high level of the concentration of production. At small and medium-sized enterprises the use of the latest equipment, particularly numerical control machine tools and robots, for the supplanting of manual labor leads to an increase of the total expenditures and an increase of the cost of products.

The increase of the efficiency of the use of fixed production capital is an important direction of the intensification of the development of the economy. In this connection the data on the dynamics of the output-capital ratio in our country over a long period are of interest. From 1926 to 1940 it increased annually on the average by 6 percent, while from 1936 to 1940 it increased by 7.8 percent. During the postwar years the output-capital ratio increased through 1958 inclusively. Then its decrease, which is occurring in a number of sectors of our economy even now, began. This is the result first of all of the building of a considerable number of enterprises with an inadequate level of the concentration of production, the inadequate use of fixed capital due to disproportions in many regions between the number of workplaces and the amount of manpower resources, the incomplete supply of enterprises with raw materials, materials and others.

There are also other factors which were responsible for this process, namely: the relaxation of attention toward the use of the factors which increase the level of the output-capital ratio, with the one-sided consideration of the factors which decrease it, the appearance in economic science of the opinion concerning the

3. PRAVDA, 17 November 1981.

natural increase of the capital-output ratio under the conditions of the scientific and technical revolution, that is, which justify the decrease of the output-capital ratio and others.

In the draft of the plan for the 11th Five-Year Plan, as L. I. Brezhnev noted at the November (1981) plenum, the tendency for the output-capital ratio to decrease in a number of sectors of the national economy had not yet been overcome. The materials-output ratio is changing slowly and the production cost is decreasing slowly.

The optimization of the level of the concentration of production leads to the improvement of the technological structure of fixed capital. The proportion of its active portion increases and the proportion of its passive portion decreases accordingly, which creates the basis for the stable increase of the output-capital ratio.

The use of the reserves of the increase of efficiency, which are connected with the comprehensive intensification of the economy, depends to a great extent on the development of machine building. The machine building potential of our country is significant. The pool of operating machine tools amounts to about 5 million units,⁴ which is approximately twofold more than in the United States. The USSR leads the United States in the production of some types of products--diesel engines, electric locomotives, tractors, combines, refrigerators, wristwatches, but lags in the yield of the final product of all industry (its total output). The reasons for this are the poor development of specialization, first of all parts and technological specialization, the inadequate use of such a form as assembly plants, the inadequate level of the concentration of the production of general machine building products and others.

The expansion of the use of industrial robots, machining centers and numerical control machine tools will have a substantial influence on the further development of the processes of the concentration of production. In many countries of the world work on the development of robots is being actively carried out, their production is being expanded. Japan, the United States and the countries of Western Europe produce more than 300 models of robots. More than 200 modified versions of robots have been developed in our country. During the 10th Five-Year Plan about 3,000 of them were produced, while in 1981-1985 8-fold more will be produced. Domestic robots of a large number of types are being produced in series and are in keeping with world standards. During the current five-year plan they will find use in practically all the sectors of the national economy.

Soviet scientists have developed type size series of industrial robots and have prepared suggestions on the standardization of their components, which have been submitted to the sectors for approval and have been approved by the USSR State Committee for Standards. The studies conducted by Leningrad scientists show that such an assembly encompasses 10 pneumatic, 15 electromechanical and 20 hydraulic components (modules). Their use makes it possible to speed up by several times the designing and assimilation of the production of new models of robots. Estimates

4. "My i planeta. Tsifry i fakty" [We and the Planet. Figures and Facts], Moscow, Politizdat, 1980, p 89.

show that in the case of the production of 120,000 robots with the use of the modular principle the current expenditures will decrease by 150 million rubles and the capital investments will decrease to one-tenth to one-eighth. In the case of the production of third generation robots ("intelligent machines") it is expedient to use the modular principle also when producing the control units. It is impossible to develop the mass, highly economical production of robots without the standardization and the specialized production of the components.

Both domestic and foreign experience in operating robots attests that their potentials in the area of efficiency are realized when used by large groups (complexes, sections, shops), which, of course, presumes the use of robots at enterprises with a high level of the concentration of production. Thus, at the Kovrov Machinery Plant as a result of the use of Tsiklon and Universal robots in the stamping and machining sections labor productivity increased threefold, at the Petrodvorets Watch Plant (in assembly) it increased sixfold.

The intensification of production in many ways is predetermined by the state of capital construction.

During the past period among the projects under construction the proportion of enterprises with an estimated cost of up to 3 million rubles increased by several times.

The ratio between large (with an estimated cost of more than 3 million rubles) and small projects (with an estimated cost of less than 3 million rubles) during the past two five-year plans was as follows:

for operating enterprises in 1972 1:4, for enterprises under construction in 1973 1:2.5, for enterprises, the construction of which was included in the plan, in 1975 1:20, in 1979--1:23.

The increase of the number of small enterprises was one of the essential causes of the increase of the cost of a unit of production capacity and adversely affected the indicators of production efficiency.

The aspiration to obtain the necessary capacities by building nonoptimal enterprises hypertrophies the need for capital investments (in particular, for equipment and construction materials) and leads to their inefficient, wasteful use. The concentration of capital investments is not only the decrease of the number of construction projects, but also the building of enterprises which have the optimum size. Another aspect is the inadequate level of the concentration of production in the construction industry itself (that is, where they do the building). This leads to the increase of the cost of the projects being built and checks the concentration of production in the client sectors.

The departmental isolation of the construction industry adversely affects the development of new sectors of the national economy and slows the changeover of the economy to the path of intensive development. The concentration of production in the construction complex is an exceptionally urgent task at the present stage. From 1960 to 1979 the number of primary construction and installation organizations increased to 30,514, that is, 2.5-fold. The average amount of construction and

installation work performed by one organization has increased negligibly--from 1.86 million rubles to 2.34 million rubles. For the country as a whole the proportion of primary contracting organizations with an amount of work of up to 1 million rubles decreased from 23 percent in 1970 to 18 percent in 1978, while that of large construction organizations (with an amount of 3.2 million rubles to 5 million rubles and over 5 million rubles) increased slightly.

The index of the output-capital ratio, which is calculated in terms of the ratio of the growth rates of the national income and capital investments, for the period since 1950 gives some idea of the dynamics of the effectiveness of capital investments: 1950--1.0; 1965--0.82; 1970--0.82; 1975--0.77; 1980--0.81; 1985 (plan)--0.87.

The steps taken by the party and government on putting matters in order in capital construction of the country changed the dynamics of the effectiveness of the output-capital ratio during the past five-year plan. During the current five-year plan the positive trend not only should be consolidated, but will also undergo further development.

In the decisions of the 26th CPSU Congress and the November (1981) plenum it is outlined to improve radically the state of affairs in construction and to increase the effectiveness of capital investments. The material and technical base of construction is being strengthened, unfinished construction is being reduced, such methods of the organization of construction as the complete block, the special shift and the unit-by-unit methods are being improved. The increase of the capacities of territorial construction and installation organizations in the regions of concentrated construction, the strengthening of the industrial base and the development of the network of mobile contracting organizations and a number of other measures will make it possible to build quickly, economically and at a high technical level and to increase the effectiveness of capital investments.

When examining the problem of improving the planning of the concentration of production it is necessary first of all to determine its place in the elaboration of the sectorial and territorial aspects of the plan. The separate solution of these questions makes it possible to decrease the scale of the tasks of finding the optimum sectorial and territorial plans of development, expedites and facilitates the drafting of the latter. Such an approach creates the conditions for the improvement of the quality of the designing of new enterprises and the increase of the scientific soundness of the plan of capital investments and the assignments on the development and production of new equipment with allowance made for the capacities of the individual units. However, for all the usefulness of the separate solution of the problems of the concentration of production, the comprehensive approach to them is incomparably more effective. Therefore, the main direction of the improvement of planning consists in the transition from the relatively autonomous to the closely coordinated solution of such major problems as sectorial concentration, the location of production and territorial concentration.

In contrast to sectorial concentration, which ensures the increase of the socialization of production "vertically," the territorial concentration of production leads to the development of socialization "horizontally." It should be stressed that territorial concentration is not only the simple increase of the scale of production on a specific limited territory, but also the improvement of its

spatial organization, first of all owing to the creation of a common production and social infrastructure and the assurance of the stable balance of its development and the development of the sectors of specialization.

Consequently, the comprehensive solution of the problems of the optimization of the size of enterprises, the size and structure of industrial centers and territorial production complexes and the formation of a common production and social infrastructure in regions are conducive to the more complete utilization of both the sectorial and the regional reserves of the increase of production efficiency, particularly to the rational and effective use of capital investments, productive and nonproductive capital and manpower resources. All these questions require special examination.

The planned management of the processes of the concentration of production presumes, first, the well-founded solution of the question of the plan indicators of the concentration of production and, second, the elaboration of methods of the optimization of the scale of production on the sectorial and regional levels.

An interconnected system of plan and analytical indicators is one of the most important components of the economic mechanism. Through the plan indicators, the role of which is multi-aspectual, the idea of the plan is formulated and the requirements of economic laws are expressed quantitatively. The role of evaluation indicators of the activity of certain links or others of the unified national economic complex is assigned to the leading ones.

The plan and analytical indicators of the concentration of production should make it possible to identify sufficiently accurately and completely the real trends of its development and should help to manage it according to plan. It is expedient to break these indicators down into two groups: those which characterize the level, rate and effectiveness of the concentration of production as a whole and those which reflect the concentration of individual components of production--manpower, means of labor (fixed capital) and objects of labor.

There are grouped with the indicators of the first group (general indicators) in the sectorial link:

the volume of output produced on the average per enterprise, in value or physical terms;

the proportion of large enterprises (and, under the conditions of the planning of concentration, the proportion of enterprises which have the optimum size) in the volume of sectorial output;

the integral (comprehensive) indicators of the effectiveness of the concentration of production.

There are grouped with the indicators of the second group (specific indicators):

the amount of industrial productive capital on the average per enterprise of the sector;

the amount of raw materials processed on the average per enterprise (are used in a number of sectors of the food industry);

the number of working people (workers) on the average per enterprise;

the indicators which characterize the proportion of large enterprises: in the industrial productive capital of the sector; in the total amount of raw materials processed by the sector; in the number of working people (workers) of the sector. The first and second indicators reflect with a certain accuracy the dynamics of the level of concentration only in the case of an invariable output-capital ratio and output-object ratio.

The indicators of the second group characterize the effect of concentration on the efficiency of the use of the individual components of production--labor productivity, the output-capital ratio and the output-object ratio (an indicator which is the inverse of the materials-output ratio). Together and separately they do not give a general idea of production efficiency in the different size groups of enterprises. The use of the indicator of the number of working people (workers) for characterizing the level of the concentration of production in the case of a high rate of technical progress and with great differences in the technical level of the enterprises belonging to the sector can lead to erroneous conclusions and therefore is not recommended for use.

Thus, of the two examined groups of indicators the indicators of the first group characterize most reliably and accurately the development of the concentration of production and its efficiency.

Under the conditions of the purposeful planning of the concentration of production it is advisable to use for a complete and general characterization the indicator of the level of the optimization of the scale of production. It is calculated in terms of the ratio of the output produced at enterprises of the optimum size to the total output produced in the sector. The calculation of such an indicator is also justified for industry as a whole. The use of this indicator makes it possible to identify not only the established trends of the concentration of production, but also the amount of untapped reserves in this area.

On the basis of the three indicators named above--productivity, the output-capital ratio and the output-object ratio--which are of independent importance, it is possible and necessary to create the integral indicator of the comprehensive production efficiency. It characterizes unambiguously the change of production efficiency, particularly due to concentration as compared with its base level. The creation of such an indicator, which reflects the main interrelations between the expenditures of the main elements of production and its results, increases the generality, analyticity and effectiveness of the indicators which characterize the economic efficiency of the concentration of production.

In planning practice more and more attention is being devoted to the questions of the management of the processes of the concentration of production.

The basic form of the planned management of the processes of the concentration of production under socialism is the optimization of the specialization and size of

enterprises, the scale and structure of industrial centers and territorial production complexes. However, the set of necessary conditions for the optimization of the size of enterprises does not exist everywhere. Therefore, under certain conditions small, first of all narrowly specialized enterprises may also be built. Thus, during the 11th Five-Year Plan it is planned to build small-capacity metallurgical plants at the site of the formation of ferrous metal scraps and the use of metal products. At present 240 such miniplants exist in the world. Their annual total capacity is 36 million tons of steel, which is about 5 percent of its world production.

The optimization of the level of the concentration of production, just like the optimization of any economic process or decision, is the selection of the best version of all the possible ones. This work is divided into three successive stages:

the determination of the number of possible versions of the size of the enterprise, the industrial center, the territorial production complex;

the determination of the criterion of optimality for each of the named forms and the calculation of the number of its components for the versions;

the finding in conformity with the selected criterions of the optimum size of the enterprise, the industrial center, the territorial production complex.

Under present conditions scientific and planning organs are faced with important tasks in the area of the improvement of the organizational structure of the economy. This will require the increase of the functions and rights of territorial planning organs, certain changes in the financing and planning of the construction of the objects of the production and social infrastructure and in the formation of intersectorial works.

The creation of a more perfect system of the planning of the concentration of production on the basis of the increase of the interaction of the sectorial and territorial principles is dictated by the practical needs of the Soviet economy and is of great importance for the accomplishment of the tasks set by the 26th CPSU Congress on the changeover of the economy to the intensive means of development.

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RESOURCE UTILIZATION AND SUPPLY

ROLE OF SCIENCE IN SAVING MATERIAL RESOURCES

Moscow PLANOVYE KHOZYAYSTVO in Russian No 12, Dec 81 pp 16-25

/Article by A. Chubarenko, chief of a department of USSR Gosplan: "Scientific and Technical Progress and the Economy of Material Resources"

/Text/ In the materials of the 26th CPSU Congress and the subsequent decisions of the party and the government the task is set to make the careful handling of public property the heart of economic policy during the 11th Five-Year Plan. The party has repeatedly stressed that our further progress will depend to a greater and greater extent on the skillful and efficient use of all available resources--labor, fixed capital, fuel and raw materials, the products of fields and farms. "The economy should be economical--such is the requirement of the times," L. I. Brezhnev said at the 26th CPSU Congress, and this appeal found an enthusiastic response among all the Soviet people.

In the 11th Five-Year Plan precise assignments on the economy of material and manpower resources have been established and rigid restrictions on their consumption have been introduced for ministries, departments, union republics and enterprises.

The decree of the CPSU Central Committee and the USSR Council of Ministers "On Stepping Up the Work on the Economy and Efficient Use of Raw Material, Fuel, Energy and Other Material Resources" advances tasks on the decrease of the losses in the process of production and storage of metal, fuel, wood, cement, mineral fertilizers, agricultural and other products, the decrease of the materials-output ratio in the production of items, the recovery of waste products and secondary resources, the extensive introduction of resource-saving technological processes and the decrease of the production cost and transportation costs. Therefore, all the reserves of the economy and the increase of the output of the final product from available resources have to be mobilized.

Basic and applied research, which is aimed at the efficient use of all types of material resources, the development and introduction of resource-saving equipment and technology and the expansion of the output of high quality products, is called upon to play a most important role in the accomplishment of such tasks. As practice attests, considerable reserves exist in this matter.

The work of Moscow scientific research and planning and design organizations on the discovery and realization of reserves was approved in the decree of the CPSU

Central Committee "On the Initiative of the Collectives of a Number of Enterprises of Moscow on the Extensive Use of the Achievements of Science and Technology for the Purpose of Ensuring the Economy of Manpower, Material and Energy Resources." A comprehensive program of the increase of the quality of metal products and the efficiency of their use has been elaborated in Chelyabinskaya Oblast. During the years of the 11th Five-Year Plan it is planned to assimilate the smelting of more than 100 new grades of steel and the same number of economical shapes of rolled metal products, to increase by 1.5-fold the output of products with the Seal of Quality and to save about 700,000 tons of ferrous metals.

The initiative of the collective of the All-Union Scientific Research Institute of Planning of Hydroprojects imeni S. Ya. Zhuk on the increase of the scientific and technical level of designs and the decrease on this basis of the estimated cost of the construction of projects and the economy of manpower and material resources, which was approved by the CPSU Central Committee in August 1981, received a broad response of the scientific and technical community. The collective of the institute decided to decrease the estimated cost of the construction of the hydraulic developments designed by it during the 11th Five-Year Plan by 230 million rubles and to reduce the consumption of cement by 370,000 tons and rolled metal products by 110,000 tons.

These initiatives on the more extensive enlistment of scientific research and planning and design organizations in the solution of the problems of saving material resources are of great national economic importance. After all, for example, the decrease by one-half of the losses and scrap of metal in metalworking is equivalent to a 10-percent increase of the production of finished rolled ferrous metal products.

According to the data of the Institute of Problems of Materials Technology of the Ukrainian SSR Academy of Sciences, due to the low durability of friction joints the annual losses in the operation of machines and devices amount to several billion rubles. In the motor vehicle and tractor industry the consumption of metal for the production of spare parts exceeds its consumption for the production of new machines.

The problem of protecting metal against corrosion is of great importance. The economic harm from the corrosion of ferrous metals is estimated at more than 10 billion rubles a year. The indirect losses from it as a result of breakdowns, the halt of production and the leaking of materials (for example, gas, petroleum and others) are considerable.

One of the means of saving metal and eliminating its losses from corrosion and the premature wearing out of friction joints is the use in machines and instruments of parts which have been produced by the method of powder metallurgy. The latter is revealing extensive opportunities both for the development of new materials with set properties and for the improvement of the technology of producing parts of machines by means of its improvement, the reduction of the materials-output ratio and the considerable decrease of the scraps and losses of metal in the production process. During the first half of 1981 in accordance with the assignments of the state plan alone in the sectors of machine building more than 10,000 tons of parts were produced by the method of powder metallurgy.

The application of coatings made from powder to the parts of machines and to equipment makes it possible to increase greatly the service life of the friction joints of motor vehicles, tractors, agricultural and textile machinery, to achieve a significant saving of metal due to the prevention of corrosion and the strengthening of friction joints, to decrease the production of spare parts and to increase the tool life.

One of the effective methods of protecting metals with coatings is the plasma spraying of metallic powders, in case of which, in contrast to surfacing, the melting of the surface layer of the base metal with the corresponding decrease of the mechanical properties does not occur. The expenditures on the reconditioning of worn out parts by the method of spraying come to about 20 percent of the cost of new parts.

During the 11th Five-Year Plan our scientists, engineers and process engineers have to perform work on the development of new materials and technological processes of the application of electroplates, paint and powder coatings, rolled metal and pipe with various protective coatings, main pipelines, urban underground mains, ships and hydraulic structures with electrochemical protection in conjunction with insulating coatings. The placement into operation of completely mechanized and automated shops, sections, automatic lines, highly productive units and equipment for the application of coatings and of capacities for the production of electroplating and painting equipment is planned. It is envisaged to organize on an extensive scale the production of rolled ferrous metal products with protective coatings (with chromium, aluminum, polymeric materials and others). This will make it possible to increase by 4- to 6-fold the operating life of equipment and to decrease the consumption of scarce metals.

For the purpose of improving the use of rolled metal in machine building constant work is being carried out on the enlargement of its assortment. During the first half of 1981 alone the production of 50 new economical sections of rolled metal products--shaped hot-rolled, cold-bent, high precision steel shaped--was assimilated. Their use will make it possible to decrease the consumption of finished rolled metal products by 20-40 percent and to reduce the metal content of machines and equipment. The production of wide flange beams and high-strength pipe for the petroleum and gas industry is increasing. The assimilation of economical electric steels with lower watt losses is of great importance. Their use in the production of transformers and electric motors ensures the reduction of the consumption of metal and the losses of electric power. A set of measures on the improvement of the use of raw materials, materials and fuel in ferrous metallurgy on the basis of the improvement of the technology of steel smelting and blast furnace processes is also being implemented.

In connection with the increasing shortage of coking coals for obtaining metallurgical coke the need has arisen for their replacement with gas, poorly coking and noncoking coals. The development and assimilation of new technological processes, particularly the thermal conditioning of the charge before coking, which will make it possible to use up to 70 percent of the gas coals, to increase by 30-40 percent the output of the coke ovens and to improve the quality of coke, are envisaged for these purposes.

One of the most important directions of the economy of ferrous metals at the stage of their production is the introduction of the continuous casting of steel.

During the 11th Five-Year Plan a new industrial complex consisting of four machines of the continuous casting of billets with an electromagnetic stirrer of the metal for obtaining high quality steel billets from high-alloy steels, including ball-bearing steel, will be set up and put into operation for the first time at the Oskol'skiy Electrometallurgical Combine.

Until recently the process of forging was the basic method of obtaining the billets of the axles of rail transport. It is unproductive, the finished billets of axles, which are obtained for machining, are irregular in form and have considerable allowances for size and, as a result, a large weight.

During the 10th Five-Year Plan a new process of obtaining the billets of axles for rail transport by the method of rotary rolling on a 250 mill, which has no analogs in world practice, was introduced at the Dneprovskiy Metallurgical Plant. The productivity of the mill is 320,000 car axles a year, which is 5- to 6-fold greater than the productivity of forging machines. As a result at railroad car plants the consumption of metal due to the increase of the precision of the billets and the decrease of the waste in chips is decreased by 40-60 kg per axle (with a weight of the finished axle of 415 kg). The amount of machining and accordingly the number of lathe operators also decrease.

During the 11th Five-Year Plan the assimilation of the production on an axle rolling unit of hollow car axles as compared with solid axles will provide a saving of 90-100 kg of metal per axle.

During 1981-1985 a large amount of work is planned on the development and assimilation of the industrial production of a number of new artificial materials which are used to replace metal. In addition to the direct advantages, which are connected with the saving of pig iron, steel and nonferrous metals, the introduction of new materials, as a rule, is accompanied by the simultaneous decrease of energy and labor expenditures when producing items, the decrease of the cost of their production, an increase of the operating qualities of items and the improvement of working conditions.

Hundreds of thousands of tons of cast iron are used for the production of the basic parts of machine tools and machines. The use of nonmetallic materials would make it possible to obtain additional reserves of the economy of pig iron.

At present the Moscow Krasnyy proletariy Plant, the Moscow Plant imeni S. Ordzhonikidze and a number of other enterprises of the Ministry of the Machine Tool and Tool Building Industry jointly with the All-Union Scientific Research Institute of Concrete and Reinforced Concrete of USSR Gosstroy are performing work on this problem. A semi-automatic lathe with a reinforced concrete base has already been produced and is undergoing tests at the Krasnyy proletariy Plant. The development of a semi-automatic numerical control lathe with a concrete base is planned. If the results of this work are favorable, the saving of metal will be 1.5-1.7 tons per machine tool.

The main research institutes of the Ministry of the Machine Tool and Tool Building Industry are performing work on the study of the possibility of replacing metal with high-strength and prestressed reinforced concrete, special and epoxy concrete, natural granite made from whole cut blocks in hydraulic presses with an even load, in specialized precision grinders and in precision measuring machines.

The use of polymeric materials provides a substantial saving of rolled metal products in machine building: 1 ton of them replaces 3-4 tons of rolled metal.

Heavily loaded thermoplastic polymeric structural materials, which will be used extensively in the automotive industry, shipbuilding, the aircraft industry, the electrical equipment and electronics industry and other machine building sectors, are very promising. The economic impact from the use in the national economy of 1 ton of a product is 4,500-5,000 rubles.

The development of a continuous technological process of the production of polyethylene under low pressure with the use of highly active catalysts with a productivity of 100,000 tons a year is envisaged. This will make it possible to obtain polyethylene of low and high density on the same equipment with a decrease of the energy expenditures, the production cost and the specific capital investments and a saving of the base raw material.

In the production of new polymeric structural materials--so-called norplasts--mineral fillers, which ensure a decrease of the specific expenditures of the base polymers and an economy of the resources of organic raw materials, will receive extensive use (up to 20-50 percent).

USSR Gosplan, the State Committee for Science and Technology and the USSR Academy of Sciences have approved for the 11th Five-Year Plan a scientific and technical comprehensive goal program on the elaboration of the technology and the development of the industrial production of heavily loaded and composite polymeric materials, as well as pipe, sheets, machine building, construction and other items made from them. The implementation of the program has been assigned to the Institute of Chemical Physics of the USSR Academy of Sciences, the Norplast Scientific Production Association of the USSR Ministry of the Chemical Industry and a number of other organizations.

A range of high-strength industrial fibers for the tire and rubber industry and construction materials for various sectors of the national economy, due to the use of which the operating properties of items will increase with a decrease of the materials-output ratio, the need to use natural fibers in industrial items will disappear completely and the released resources will be allocated for the production of consumer goods, will be developed. The use of new industrial fibers when producing large tires will make it possible to decrease the number of plies in the carcass by 11-22 percent and to reduce the consumption of cord on the average by 16 percent, rubber by 8 percent and the weight of tires by 2-9 percent.

With the introduction in production of high-strength polyamide film fibers, which have been developed by chemical scientists, the operating properties of cordage, baling twine, container and packaging materials will improve considerably as compared with the metal wire and items made from natural fibers, which are now being

used. In this case their strength characteristics are retained and raw materials are saved.

A large saving of resources can be achieved in construction by the development and introduction of new construction materials. Thus, there is envisaged at cement plants the introduction of a fundamentally new low-temperature (saline) technology of obtaining cement, which makes it possible to decrease the temperature of the roasting of the cement clinker from 1,450°C to 1,100°C and fuel consumption by 25 percent. The assimilation of the production of cement with crystallizing agents, which ensure the obtaining of its high-strength and special types, is very promising. By 1985 it is planned to increase the output of such types of cement to 2 million tons, while reducing the energy expenditures by 10-15 percent.

An important direction of the economy of fuel, energy, material and manpower resources is the development and introduction in production of highly productive technological equipment and units with unit capacities which have been increased to the optimum limits. This direction is most efficient at large-tonnage and large-series works, which produce large batches of similar products--the mining sectors of industry, the chemical and petrochemical industry, metallurgy, the production of construction materials and power engineering.

Thus, in chemical machine building the development of large and super-large pumps with a unit capacity of up to 200 MW will provide a considerable annual economic impact. In the construction materials industry the introduction of large water heaters with a capacity of 2.5 gigacalories per hour in mobile boiler plants will make it possible to reduce by one-half the metal content of the plant per unit of generated heat, to sharply increase its output as compared with the equipment being produced and to decrease the expenditures on the construction of projects.

The introduction of economical units with a large unit capacity in power engineering is one of the main factors of the decrease of the specific consumption of fuel for the generation of electric power. In conformity with the assignments of the state plan the specific consumption of fuel at thermal electric power stations during the first half of 1981 was 322.7 g/kWh as against 323.8 g/kWh during the first half of 1980, which provided a saving of about 500,000 tons of conventional fuel.

The replacement of the units now in operation for the production of sulfuric acid with a productivity of 450,000 tons a year with units with a productivity of 740,000 tons a year will be carried out in the chemical industry. By means of this the specific metal content of the technological line will be decreased to one-third to two-fifths, the emissions of sulfur dioxide into the air will be reduced considerably; the specific capital investments will decrease from 38 to 35 rubles per ton of output, while the production cost will decrease by nearly 6 percent per ton of output.

The main direction of technical progress in the area of the transportation of gas is the increase of the pressure in gas pipelines with a diameter of 1,420 mm from 75 to 120 atm, which increases their productivity by nearly 60 percent. This problem will be solved by the use of the technology of producing multiple pipe, which was developed at the Institute of Electric Welding imeni Ye. O. Paton. Here the specific consumption of metal decreases by 20-25 percent, the specific capital

investments decrease by 15-18 percent and tens of thousands of tons of metal are saved.

In the automotive industry the increase of the carrying capacity of vehicles and the horsepower of the power plants reduces considerably the cost of transportation and promotes the saving of fuel. Thus, the new trailer truck with a carrying capacity of 23.5 tons with a KamAZ-54102 diesel tractor as compared with the trailer truck being produced on the basis of the KamAZ-5410 with a carrying capacity of 14.5 tons consumes per ton-kilometer of operation 21 g of fuel instead of 26 g. With its operation the capital expenditures per ton-kilometer decrease from 1.09 to 0.8 kopeck (29 percent), while the cost of transportation decreases from 2.46 to 1.7 kopecks (30 percent). For every trailer truck 11,900 rubles of operating costs are saved in a year.

An effective means of saving metals and other materials is the extensive use of resource-saving technologies and new technological equipment, which promote the decrease of defective output, the increase of the quality of items and the reduction of the consumption of source materials. As a rule, such equipment is developed with the use of the latest achievements of science and on the basis of new scientific and technical principles.

As an example it is possible to cite the semi-automatic unit for the pouring of pig iron into molds with a productivity of 16 tons/hr, which was developed by the Scientific Research Institute of Special Methods of Casting of the Ministry of the Machine Tool and Tool Building Industry. In it the magnetodynamic effect is used for stirring the molten metal. The unit increases considerably the rate of operation of the casting units, combines well with them in a technological chain, provides as compared with manual pouring a saving of not less than 250 tons of metal a year, reduces by 2-3 percent the defective castings and decreases to one-third the number of attendants.

At the Cherepovets Metallurgical Plant the technology of the converter conversion of low-manganese pig irons with the obtaining of high quality steels is being successfully assimilated for the first time in domestic and world practice. A complex of the oxygen converter shop, which is fitted with equipment for processing outside the furnace and continuous casting and with the latest means of the monitoring and control of the technological process, is being introduced for this purpose. At present two 350-ton converters, two continuous casting machines and two units for processing metal in ladles have been put into operation. The assimilation of the complex will increase the yield of suitable metal by 15 percent, as well as will increase labor productivity, decrease the proportion of difficult manual labor and reduce emission of harmful gases into the air.

The automation of the control of gas compressors at the Severodonetsk Azot Production Association made it possible to save up to 40,000 kWh of electric power quarterly, the automation of the air dehumidifying stations made it possible to save more than 50,000 kWh.

A graphic example of energy-saving technology is the extensive introduction of catalysts for the synthesis of inorganic and organic products and processes of petroleum refining.

The use of catalysts when burning fuel for obtaining heat for technological and other purposes is promising. The Institute of Catalysis of the Siberian Department of the USSR Academy of Sciences has proposed and designed the first catalytic heat generators, which are considerably more efficient than conventional fuel spray furnaces. They can be used not only for obtaining heat, but also in the production of various products (for the drying of grain and coal, the obtaining of sulfur, the neutralization of sewage). A ton of catalyst can save about 2,000 tons of fuel. It is now the turn of industry, which should develop and set up the production of the corresponding products and units.

Thermal, physicochemical and microbiological methods of increasing the petroleum yield of beds and equipment for injecting into the bed heat carriers and chemical agents, which are capable of displacing and washing out the petroleum, will be used in the production of petroleum. As compared with the technology of injecting water into the bed the new technology is 20-30 percent more effective.

In the pulp and paper industry in 1981-1985 there is has been planned the implementation of a scientific and technical program on the development and assimilation of technological processes and equipment for the production of new types of products, which ensure an increase of the completeness of the use of wood raw materials, the more extensive involvement in processing of low quality wood and waste paper and the reduction of the consumption of chemicals and water. In particular, the introduction of the oxygen-soda method of cooking pulp, which was developed for the first time in our country, is envisaged. It decreases the consumption of wood per ton of pulp by up to 4-5 percent and eliminates the use of sulfur compounds, due to which the condition of the environment is improved appreciably and capital investments are saved.

The work connected with the use of renewable sources of energy (the energy of the sun, geothermal waters and the wind) and the development of equipment, which is based on the use of new physical phenomena, for example, superconductivity and the direct conversion of thermal energy into electric power (the magnetohydrodynamic generator), are of great importance in the economy of fuel and energy resources. Thus, the work performed on the development of the first models of turbogenerators with a capacity of 5-20 MW makes it possible to hope that during the 11th Five-Year Plan the development of a turbogenerator with a capacity of 300 MW is possible, while in the future the increase of the maximum capacity of a single unit to 1,000-1,500 MW is possible. The machines of this type will be 20-30 percent smaller in size and weight.

The development and assimilation in production of a considerable number of descriptions of models of new equipment, technological equipment, apparatus, instruments and materials are envisaged in the scientific and technical programs for the 11th Five-Year Plan. As a rule, the new machines, units and equipment not only are more productive, but also have better specific indicators of the consumption of material, fuel and power and of the labor expenditures per unit of produced output and provide a large economic impact and a saving of manpower, energy and material resources.

For example, by installing a small water boiler, which is being developed in accordance with one of the scientific and technical comprehensive goal programs for

the power blocks of thermal electric power stations, which run on Kansk-Achinsk coals, the height of the main structure of the electric power station will be decreased by 20 m. As compared with the design of a similar capacity for the Bere-zovskay GRES-1 the new design will require 5,000 tons less metal. The annual economic impact is 6 million rubles per block.

The development and placement into operation of heat pumping stations with a capacity of 60-200 gigacalories per hour with the use of the waste and circulating water of industrial enterprises will make it possible to reduce by the planned amount of introduction in 1985 the consumption of 28,000 tons of conventional fuel.

The implementation of scientific and technical measures on the increase of the quality of electric power, the energizing and reduction of the losses in the power networks of the Unified Power System of the USSR will decrease the losses of electric power in 1985 by 10 billion kWh. This will occur due to the increase of the level of the reactive power compensation of the power networks, the changeover of transformers to operation in an automated mode of voltage regulation, the development and assimilation in production of new types of power capacitors, unitized power capacitors with higher technical and economic indicators and controlled static capacitors with a capacity of 1,000-1,250 MW, the introduction of data measuring devices for the monitoring and statistical evaluation of the quality of electric power and other directions recommended by science.

Sectorial and regional comprehensive goal programs, including scientific and technical programs, will play a significant role in the economy of resources. Definite experience has been gained in the Ukrainian SSR, the Latvian SSR and other union republics in the formulation and implementation of comprehensive goal programs.

In the Ukrainian SSR six programs, which are aimed at the mobilization of the reserves of the economy of metal, power and manpower resources, have been approved. The introduction of high-strength pig iron, which will provide a saving of about 8 million rubles a year, has been outlined in accordance with the Metall Program. The Agrokompleks and Sakhar programs have been coordinated with the tasks of the all-union food program. Thus, scientists of the Ukrainian SSR Academy of Sciences have proposed new methods and have developed the technological equipment for the drying and freezing of products, their storage in regulated gaseous environments and the utilization of the waste products of the food industry. The applied science conference on methods of the waste-free technology of the processing of fruits and vegetables, which was held in October 1981 in Krasnodar, summarized the first stage of this work and outlined the means of its expansion during the 11th Five-Year Plan. But the preliminary calculations of scientists of the Ukrainian SSR Academy of Sciences attest that just from the pressed residue of fruits and vegetables, which is formed during the production of juices, canned goods and wine material, it is possible in the future to obtain up to 1 million tons of powders, which will be used to replace 700,000 tons of sugar both in the confectionary industry and in other spheres of its use.

In Cherkasskaya Oblast the oblast comprehensive goal program, Ispol'zovaniye metalla, has been elaborated, in which the decrease of the metal content of the items being produced in the process of designing, the assimilation of a low-waste and waste-free technology and the use of new means of the corrosion protection of metals have been outlined. The program envisages a decrease of the rates of

consumption of metal by 10-15 percent and an increase of its utilization ratio in 1985 to 0.75 as against 0.6 in 1980. But a saving of just 1 percent of the metal for the oblast is equivalent to its annual consumption by the Kamenskiy Machine Building Plant imeni 50-letiya Sovetskoy Ukrainy.

A sectorial comprehensive goal program of the increase of the efficiency and the use of material resources in 1981-1985 has been drawn up in the Ministry of the Machine Tool and Tool Building Industry. During the 5-year period it is proposed to save approximately 450,000-460,000 tons of ferrous metals and to increase the utilization ratio of rolled metal from 0.61 to 0.67.

The Ministry of Power Machine Building has elaborated a comprehensive program for the 11th Five-Year Plan on the economy of fuel, energy, manpower and material resources at the enterprises of the sector. It envisages the saving of more than 500,000 tons of metal (of them 80 percent are due to design measures), more than 160,000 tons of rolled ferrous metal products, 87,000 tons of conventional fuel and about 300 million kWh of electric power.

There is in effect at the Bratsk, Volkhov and other aluminum plants the Energiya comprehensive goal program, which was elaborated by the specialists of these enterprises in conjunction with Leningrad scientists for the 11th Five-Year Plan and up to 1990. At the Bratsk Plant by means of the recovery of the heat of the exhaust gases of the calcination ovens, the automatic regulation of the supply of steam for heating water, the improvement and stabilization of the process of smelting aluminum and a number of other measures it is planned in 1981 alone to save 57 million kWh of electric power, 12,400 gigacalories of heat and 1,660 tons of conventional fuel. Devices, which decrease the real consumption of fuel by 20 percent and ensure the reduction of its specific consumption by one-third, will be introduced at the Volkhov Plant in conformity with the program.

In all the sectorial and regional programs a prominent role is assigned to the introduction of the innovations of science and technology and to the assimilation of new materials and equipment, which ensure the saving of resources. However, the contribution of science and new equipment to the economy of material and technical resources should be more significant than is envisaged by the plans and assignments, since many scientific and technical achievements of today have still not been included in them and are at the stage of assimilation. For example, the idea of using the addition of water for the creation of fuel mixtures: water-fuel emulsions for internal combustion engines, fuel mixtures based on fuel oil, coal, shale and water for combustion at boiler plants and others, await their introduction.

Scientists of the Far East have proposed for the feeding of the population as a source product for the food industry so-called brown sugar, which is obtained from raw sugar cane. Equivalent in calorie content to ordinary, white sugar, it differs greatly from it in the large amount of organic biologically active substances and trace elements, which ensure an increase of the fitness of the body for work and its capacity to resist stress. The antisclerotic, antidiabetic and anticavity effects of brown sugar have also been demonstrated. Its production can provide a large economic impact due to the saving of raw materials, fuel and power, since this sugar is obtained as an intermediate technological product. It

is also possible to use the technological diagram of the production of brown sugar at sugar beet processing plants, which in addition will make it possible to shorten the period of the processing of sugar beets. The experience of the Primorskiy Sugar Combine, which in a year produces about 135,000 tons of granulated sugar, shows that the production of just 15 percent brown sugar enabled it to produce additional output from the same raw materials, to save fuel and electric power and to obtain in a year an additional 1.1 million rubles of profit. The organization of the production of brown sugar does not require capital investments for new construction, the minor further equipment of the enterprise is repaid in 2 months. The pilot industrial assimilation of the production of brown sugar and its extensive testing in the sphere of consumption have now begun.

Now it is important to create such conditions in every collective--at the enterprise, in the sector, the oblast, the republic--so that the achievements of science and the innovations of technology would be introduced as quickly as possible in production and would yield a return. Unfortunately, this is the case far from everywhere and far from always.

The technological process with submersible magnetic hydrodynamic pumps in the electric furnaces, which was developed by the All-Union Scientific Research Institute of Electrothermal Equipment, has given a favorable account of itself at the Leningrad Battery Plant of the Ministry of the Electric Equipment Industry for the casting of lead and its alloys. However, this process is not being adopted at the battery plants of the sector, but it could provide during the five-year plan a saving of about 10,000 tons of lead.

The advanced technology of extracting manganese from slags by the method of magnetic separation is not being disseminated at the enterprises of the USSR Ministry of Ferrous Metallurgy. At present a large portion of the slags at best is used as a construction material, although they contain up to 16 percent manganese (the ore extracted from the ground contains 28 percent manganese).

Science solved long ago the problem of the complete extraction of metals from complex ores. By means of subsequent high temperature treatment it is possible to involve in the economic turnover and to use as a valuable source material for obtaining iron, copper, lead, zinc, gold and silver a large portion of the so-called pyrite cinders--the waste products of the enterprises of the USSR Ministry of Non-ferrous Metallurgy, which today are removed to the dumps. Now there are about 20 million tons of pyrite cinders in the dumps. Is this not an enormous reserve of the increase of the output of scarce metals and the saving of natural resources?

The pool of industrial electric furnaces in the different sectors of the national economy annually consume about 10 billion kWh of electric power. Their changeover to a new lining with the use of fibrous heat-insulating high-temperature materials (mullite-silica and basalt fiber) instead of traditional refractory materials (fireclay, highly aluminous, corundum, ceramic-perlitic and others) would make it possible not only to save up to 2 billion kWh of electric power, but also to decrease the labor expenditures in the production, modification and repair of the linings of electric furnaces, as well as to decrease the consumption of ferrous metals on the average per furnace by 250-500 kg, which in terms of the annual production of electric furnaces can provide a saving of about 3,000 tons of

them. However, the inaction of individual managers, interdepartmental barriers, the lack of production capacities and other objective and subjective factors for the present do not make it possible to solve this problem.

Great importance in the matter of the extensive enlistment of the achievements of science for the economy of resources belongs to planning organs. The party demands the making of a decisive turn of all planning and economic activity, the development of science and technology toward the more efficient use and economy of material resources. For these purpose it is necessary to increase the mobilizing importance of the approved norms and standards, to ensure their great scientific and technical soundness and the necessary periodicity of the updating of the rates of consumption of material resources with allowance made for the dates of the introduction of new equipment and technology, which are set in the plans.

In the plans of the increase of the technical level of sectors it is important to envisage advanced standards and end results with respect to the economy of raw materials, materials, fuel, energy and other resources. It is necessary for the specialists of planning organs to know better the possibilities of science and technology with respect to the development of resource-saving technologies and the economy of resources and to take them into account in good time in the plan indicators. The extensive contacts of production specialists with scientific and design collectives to a considerable extent are conducive to this.

In recent years productive contacts have been established at USSR Gosplan and the Gosplans of the union republics with scientists of the USSR Academy of Sciences, the academies of sciences of the union republics and higher educational institutions of the country. At the expanded meetings of USSR Gosplan and its Collegium in 1979-1981 the reports of scientists on the results of completed scientific research were heard and proposals on their use in the national economy were discussed. A meeting of USSR Gosplan, the State Committee for Science and Technology and the Presidium of the USSR Academy of Sciences with the participation of executives of USSR ministries and departments, party and soviet organizations, the presidents of the academies of sciences and the chairmen of the Gosplans of the union republics, which was devoted to the introduction of the results of the research and development of the institutes of the USSR Academy of Sciences in practice and the development of the material and technical base of science, was held in December 1980. Earlier such meetings were devoted to the examination of the proposals of the Siberian Department, the Ural and Far Eastern Scientific Centers of the USSR Academy of Sciences.

These discussions provided vast material for planning projections and promoted the increase of the level of the planned full-scale implementation of scientific achievements in the sectors of the national economy.

The possibilities of science and scientific and technical progress in the matter of saving material and technical resources are enormous. Not all of the reserves have yet been revealed. It is the task of scientists, engineers, technicians, workers and all specialists of planning organs to use them fully in the national economy.

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METHODS OF SAVING RESOURCES

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/Article by A. N. Alov, chief of the Moscow City Main Supply Administration: "The Efficient Use of Resources"/

/Text/ The success of the work on the tightening up of the policy of economy depends first of all on the understanding of the point and goals of the economic policy of the party, on the extent to which the worker is made aware of the importance of each saved gram of raw materials, fuel and so on. It has been calculated that a 1-percent economy of material resources is equivalent to the additional creation of national income of 2 percent, while every ruble of saving on material expenditures makes it possible to save 6 rubles of investments in the extractive sectors of the national economy.

It is clear that the drive for economy should begin at the stage of the elaboration of the plan and that the introduction in production of the most advanced design decisions and technological processes, which ensure the efficient use and economy of raw materials and materials, should be achieved.

It is extremely important to ensure the economy of material expenditures in the operation of tools of labor and first of all to decrease the expenditures on spare parts and repair work, which have increased considerably in recent years. This is a result of the inadequately high quality of the produced output and equipment, the introduction in production of "crude," unfinished designs which have a short life.

Whereas a ton of rolled ferrous metal products, which are used for the making of machines, costs 130-150 rubles, a ton of spare parts, which are used in repairing operating equipment, costs 2,200 rubles. Some machines during the period of operation consume just as many spare parts by weight as the machine itself weighs. In other words, during the period of operation several times more assets are spent on it than on its initial production. As a result an overwhelming portion of the pool of machine tools of the country is engaged in repair work and the production of spare parts.

The further expansion of the production potential is becoming a more and more expensive matter. The capital investments for the extraction of raw materials worth 1 ruble increased from 2 rubles in 1965 to 4 rubles in 1980, while by the end of the five-year plan they will increase to 5 rubles. Moreover, the process of the

increase of the cost of the extraction of raw materials will take place in the future as well. It is possible to neutralize this trend only by having seen to it that more final output is obtained for every unit of consumed fuel, raw materials, materials and energy.

The need has come to realize the substantial reserves which lie in the decrease of waste products and losses of raw materials and materials at all the stages of their processing, storage and transportation and in the more complete utilization of secondary resources and byproducts. The need for the utmost development of low-waste and waste-free technology is acquiring particular importance. Suffice it to say that if the losses and scrap of metal in metalworking were reduced if only by one-half, this would be equivalent to an increase of the production of rolled ferrous metal products by 10 percent.

Valuable experience in the saving of metal by the introduction of advanced technological processes and the use of less scarce materials has been gained in the leading collectives of Moscow. Owing to this, for example, the industrial enterprises of the capital saved during the 10th Five-Year Plan 506,000 tons of ferrous and nonferrous metals. These data attest that it is necessary to increase even more effectively the utilization ratio of material resources.

The efficiency of the use of resources directly depends on the further improvement of the mechanism of management. Specific measures, which are aimed at the increase of the level of all the work connected with planning and the rate setting of the consumption of resources, are stipulated in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Stepping Up the Work on the Economy and Efficient Use of Raw Material, Fuel, Energy and Other Material Resources." In particular, the task on improving the standards service is set. It is especially emphasized that norms should play a mobilizing role, they should be set with allowance made for the planned economy from the introduction of the achievements of science and technology and the know-how of leading enterprises. Unfortunately, there are still many cases of unsatisfactory work on the rate setting of resources, due to which, for example, a number of enterprises are not fulfilling the plan of the reduction of the rates of consumption for rolled ferrous metal products. There are still many cases when different rates of consumption are used for the same product at enterprises with the same technical level.

Stepped-up assignments on the reduction of the norms are set in the 11th Five-Year Plan. Here, as was noted at the 26th CPSU Congress, they should be regarded as the minimum assignments and assignments which are liable to obligatory fulfillment, since with the present scale of production this is not only a major reserve of economy, but also a necessary condition of the balance of the plan. In this work we have great reserves, since some rates of consumption at a number of Moscow enterprises are obviously obsolete and require revision.

The question of stocks is of exceptionally great importance. As Chairman of the USSR Council of Ministers Comrade N. A. Tikhonov noted in a report at the 26th CPSU Congress, the proper management of production stocks is an important reserve for the overcoming or, in any case, the alleviation of the shortage of a number of resources. "It is impossible to tolerate the fact," he said, "that many enterprises keep above-standard equipment, raw materials, materials, especially metals, when others do not have enough of them."

The speeding up of the use of stocks by just 1 day saves about 1.5 billion rubles. So far, unfortunately, it has not been possible to increase the mobility of stocks. The above-standard stocks at the Moscow enterprises of the Ministry of the Machine Tool and Tool Building Industry, the Ministry of Heavy and Transport Machine Building, the Ministry of Nonferrous Metallurgy and others are especially large.

The determination of the exact need for material resources is becoming one of the central questions of economy. There are still many unsolved problems here. As is known, the allocation of resources for construction projects should be carried out according to the plans and the estimates. However, the quality of planning is far from always satisfactory. For example, according to the data of a sample check of Soyuzglavkabel', the need for cables of large diameter is overstated in the plans by more than 10 percent. Hence it follows that it is necessary to check the plans carefully.

There are instances when some ministries allocate resources without regard for their actual need even for such scarce products as rolled metal. Some ministries do not set for subordinate enterprises assignments on the commitment to the economic turnover of above-standard material resources. The above-standard stocks of uninstalled equipment at the enterprises of Moscow during the 10th Five-Year Plan increased from 271 million to 395 million rubles.

The Moscow City Main Supply Administration regulates the deliveries of physical assets and provides them to enterprises with allowance made for the availability at them of above-standard stocks. The following procedure has been established: the above-standard stocks are credited to the assets for enterprises, at which the resources exceed the need. For example, during the first half of last year about 10,000 tons of above-standard stocks of rolled ferrous metal products were found, and thereby they were committed to the economic turnover.

The Mosgorbumsnabsbyt Administration during this period failed to supply to consumers about 2,000 tons of paper products in connection with the availability at it of above-standard stocks of paper and cardboard. The mentioned materials have been left in the reserve of the Moscow City Main Supply Administration, which makes it possible in necessary instances to shift them, decreasing the existing shortage.

Inefficient transit deliveries of products, the volume of which in Moscow comes to 2.5 million tons, are one of the causes of the formation of above-standard stocks. Discrepancies in planning and nonconformity between the plans of production and material and technical supply are also conducive to the formation of above-standard stocks. The cases of the noncoincidence of the actual need and the declared need are frequent. In order to eliminate this it is necessary to constantly improve the methods of planning and to introduce extensively in the process of planning mathematical methods and computer hardware.

The formation of above-standard stocks in many cases is also explained by the fact that some executives and workers of the supply of enterprises are not sure of the timely receipt of the required materials and purchase them "as a reserve." To prevent this it is necessary to improve in every possible way the system of guaranteed supply and to increase the use of commercial scrap metal, for which it

is necessary to establish a precise procedure of its calculation and collection and to forbid enterprises to fulfill the plan of the delivery of scrap metal by means of commercial scrap.

In the system of the Moscow City Main Supply Administration the Administration for the Mobilization of Internal Resources--Mosgormobres--is engaged in the sale of surplus materials and commercial scrap. This administration is performing much work on the identification, calculation and commitment to the economic turnover of commodity stocks and equipment and annually concludes more than 1,200 contracts on the rendering of services on the sale of surplus physical assets with various enterprises and organizations of the capital. However, the real possibilities of Mosgormobres are being checked by the existence of sectorial organizations which operate in parallel. Obviously, it is necessary to centralize this work within USSR Gosnab.

The development of production services is an important direction of the increase of the efficiency of the use of material resources, as well as the reduction of surplus stocks. Suffice it to say that, for example, by means of the preliminary preparation of the assortment at our enterprises the saving of metal comes to 10-15 percent.

"We cannot regard the bases of USSR Gosnab which exist in the economic regions," Comrade N. A. Tikhonov said at the 26th CPSU Congress, "simply as warehouses. They should prepare and sort out materials and supply them promptly to consumers, and in the necessary assortment and set."

At present 13 types of different services are rendered to consumers of Moscow by the supply and marketing organizations of the Moscow City Main Supply Administration. Their volume during the past five-year plan increased 1.3-fold. The existing work experience makes it possible to draw the conclusion that the organization of the supply of consumers with products in a form ready for consumption in production makes it possible to obtain a saving of ferrous and nonferrous metals of up to 10 percent, paper products--up to 15 percent, cable and construction products--up to 5 percent.

The system of the rental of tools and equipment makes it possible to obtain a considerable impact in the sphere of consumption, production and circulation. Now 1,300 organizations and enterprises of Moscow, of which 80 percent are scientific research organizations, design bureaus and higher educational institutions, have contractual relations with the Department of Equipment Rental of the Mosgorelektropriborsnabsbyt Administration, which is a specific feature of the Moscow city region. The Moscow City Main Supply Administration is setting as its goal to increase by 1985 the rental of tools by more than fivefold.

The question of how to better utilize what we have concerns first of all a more decisive change of our attitude toward questions of the use of secondary resources. It was proven long ago that their use is economically advantageous. Thus, for example, a ton of waste paper, which is channeled into the production of paper and cardboard, saves about 1 ton of conventional fuel, 1,000 kWh of electric power and 1.5 m³ of commercial lumber. It is necessary to see to it that during this five-year plan the materials and items, which are produced with the use of secondary materials, would take up a significant portion in the used resources of our country.

Moscow is one of the large economic regions, in which secondary material resources are being formed in significant quantities. Waste paper, secondary textile materials, broken glass, polymers, worn out tires and other types of secondary raw materials are being procured here in large quantities. At one time the system of Vtorsyr'ye was limited only to the gathering of waste products. Today it has a large number of processing enterprises which produce finished products. Thus, a nonwoven material, which serves as the basis of insulated linoleum, is produced at the Mosgorvtorsyr'ye Trust. In its production the waste products of the textile industry make up 90 percent of the raw material. During the present five-year plan it is planned to increase the output of this material by fivefold. A number of other types of finished products are also being produced--reprocessed wool, cast items, capron plastic and others.

These products have already received the appreciation of consumers. The use of the nonwoven material dornit, which is produced by the Rostokinskiy Factory of Mosgorvtorsyr'ye, makes it possible to decrease by 10-15 percent the labor expenditures in the construction of the earth bed of roads in swampy areas and to reduce by 10-12 percent the materials-output ratio of the work.

The considerable increase of the volume of procurement of secondary raw materials and the production from it of industrial products is envisaged during the current five-year plan. The task is to improve significantly the work on the organization at enterprises, and especially in microrayons, of the procurement of secondary resources. For this it is necessary to enlarge the procurement network and to involve the collectives of enterprises, housing services, the students of schools and so on in the work on the supply of secondary raw materials. The services of the executive committees of the city and rayon soviets of people's deputies should devote constant attention to this work.

Specific tasks for the five-year plan on the saving of wood and especially on the decrease of its consumption for the production of transportation packaging for one-time use are specified in the decisions of the 26th CPSU Congress. Some work has been performed in Moscow on the reduction of the use of new packaging materials by means of the increase of the shipment of freight in containers and reusable packaging, as a result of which during the 10th Five-Year Plan the consumption of commercial lumber for the production of new packaging decreased by 12 percent with an increase of the volume of industrial production by 21 percent.

The reuse of packaging material, which is released from the unpacking of products at industrial enterprises of Moscow, is a substantial reserve of the saving of wood. During the current five-year plan the saving of wood in Moscow due to this will be more than 5.5 million m³.

Many Moscow enterprises has gained positive experience in the transportation of their products in containers, packets and other types of advanced packaging. But these methods are still being poorly adopted. One of the basic means of eliminating losses in transportation is the increase of the volumes of the centralized delivery of freight and the forwarding of products in containers and packets by specialized transport. According to estimates, the adoption of such an advanced form of transportation as the packet and container delivery of freight in the system of material and technical supply makes it possible to decrease the expenditures on the

centralized delivery of freight by 2.2 times and to increase labor productivity nearly threefold. For example, the centralized delivery of freight in Moscow just for the system of the Moscow City Main Supply Administration annually provides a saving of 13 million rubles.

Delivery discipline has a significant influence on the economy of material resources. Much depends on the strict fulfillment of the contracts and orders of consumers, and first of all on the delivery of advanced economical materials. So far there has been no sharp improvement in the delivery of economical materials. For Moscow alone during the first half of last year about 4,000 tons of low-alloy reinforcement steel were not received, which in a number of instances led to the uneconomical consumption of metal products. Every enterprise feels what losses the disruptions of deliveries cause. However, it is possible also to reproach the enterprises themselves for this. Thus, the proportion of Moscow enterprises, which during the above-indicated period did not fulfill the plan on the sale of products with allowance made for the meeting of obligations on deliveries, was 26 percent.

The analysis of the use of material resources attests that not all of the factors of economy have a sufficiently intensive effect. For the present the imperfect system of plan and accounting indicators and the poor economic stimulation in the area of the efficient use of material resources are still a serious obstacle in the way of the reduction of the materials-output ratio. Although many systems of the payment of bonuses for the economy of raw materials and materials, fuel and energy exist in the country, many of these systems in practice are not being used, while the bonuses, which can be received in conformity with this situation, are of a purely symbolic nature. Obviously, the need has come to solve the questions of the improvement of the system of technical and economic indicators, the use of which in planning, accounting, supply and marketing will be in keeping with the tasks of increasing the efficiency of the use of material resources. A set of measures, which are aimed at the increase of the material interest of collectives in the efficient use of material resources, industrial waste products, secondary resources, byproducts and local raw materials, has already been outlined. The particular importance of the intersectorial approach to the implementation of these measures should be noted.

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